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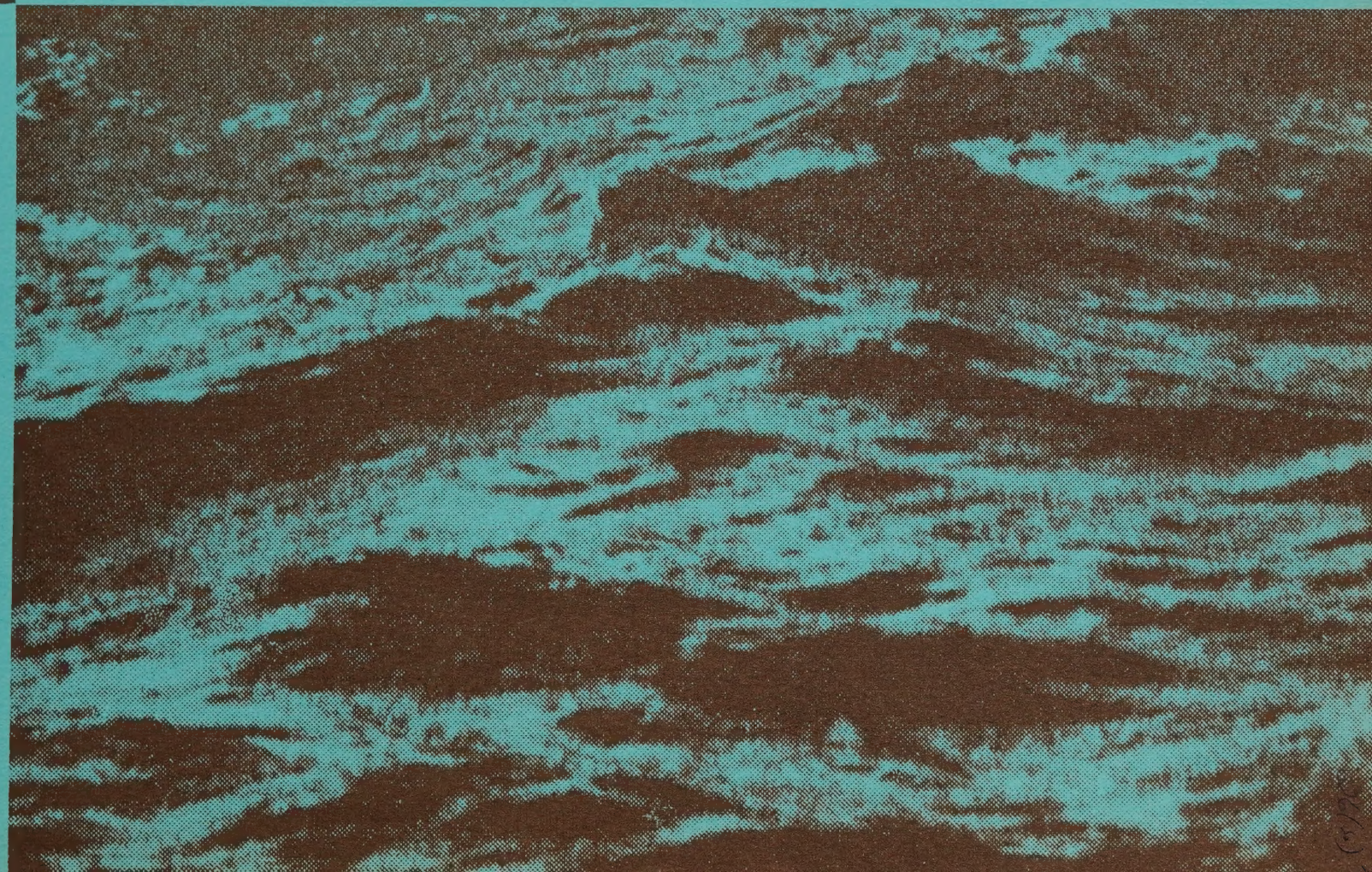

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FOREWORD

The Department of Commerce's National Marine Fisheries Service publishes the monthly journal *Marine Fisheries Abstracts* as one means of communicating to the fishing industry and allied groups the status of current fishery research. The research includes the biological aspects of fishery science as well as technological studies dealing with aquatic resource supply, harvesting, processing, utilization, and distribution.

Marine Fisheries Abstracts contains summaries of selected articles from trade, engineering, and scientific journals dealing with the entire spectrum of fishery science. The publication is designed to serve the needs of fishery scientists, engineers, and managers in industry, academic institutions, and government by supplying timely information on current progress in fishery research and technology.

For sale by the Superintendent of Documents, U.S. Government Printing Office Washington, D.C. 20402 - Subscription price: $6.50 per year, ($1.75 additional for foreign mailing). Single copy 65 cents.

0.11 (9.16) THE DESIGN AND CONSTRUCTION OF THE UNIVERSITY OF DELAWARE MARICULTURE LABORATORY

Pruder, Gary D., Charles Epifanio, and Robert Malouf (College of Marine Studies, University of Delaware, Newark, DE 19711)
Sea Grant Report DEL-SG-7-73, 96 pp. (1973), College of Marine Studies, University of Delaware, Newark, DE 19711. Price not given.

This bulletin describes the work involved in the design and construction of a mariculture laboratory at the College of Marine Studies of the University of Delaware. It covers the materials, methods, and equipment selected and a summary of costs and suppliers. Although the eastern oyster Crassostrea virginica was the species of primary interest, the facilities were designed to insure flexibility for controlled culture of a wide variety of marine organisms and for the support of research efforts in related problem areas. The laboratory was designed to fit into an already existing building of 10,000 square feet space; some equipment, also, was available. The purpose of preparing and disseminating the information in this report was to provide a guide for others faced with a similar task. Major sections deal with statements of preliminary specifications, report of survey of 11 existing major marine laboratory facilities, final design of specifications, construction and initial operation, cost summary, and three appendixes giving the boiler, chiller, and pump specifications.
[51+4 figures, 4 references] FTP

0.32 (1.92) LOW MOLECULAR WEIGHT PROTEINS OF PIKE (ESOX LUCIUS) WHITE MUSCLES--I. EXTRACTION AND PURIFICATION--POLYMORPHISM

Bhushana Rao, K. S. P., and Ch. Gerday (Laboratory of General Biology, Faculty of Sciences, University of Liège, B-4000 Liège, Belgium)
Comparative Biochemistry and Physiology 44, No. 3B, 931-937 (Mar. 15, 1973)

Other workers reported isolation of low molecular weight proteins in the sarcoplasmic protein fraction of white muscle from several carps, a species of tilapia, several species of cod, and a species of hake. Information on evolutionary changes of these protein molecules and their genetics can be gained in studies of these low molecular weight proteins.

Soluble proteins were extracted from fillets of white skeletal muscle of pike. The extract was fractionated with acetone and filtered through various columns to obtain a narrow range of fractions that corresponded to low molecular weight proteins described in other reports. After purification using chromatographic techniques the fractions were analyzed by starch gel electrophoresis.

The patterns seen in electrophoresis analysis of purified fractions were found to be species specific. In addition, low molecular weight proteins in pike resemble those in other fish and all these fish are similar in chromosomal count with few exceptions. The authors assumed that these proteins have a common ancestral gene, and they suggest that regional gene duplication and tetraploidization can explain the number of low molecular weight proteins in different species of fish.
[4 figures, 1 table, 21 references] SW

0.33 (1.36) EPITHELIAL MUCINS OF THE ATLANTIC SALMON (SALMO SALAR L.)

Harris, Jack, and Stephen Hunt (Dept. of Biological Sciences, University of Lancaster, Bailrigg, Lancaster, United Kingdom)
Biochemical Society Transactions 1, No. 1, 153-155 (Jan. 1973) (Biochemical Society, 7 Warwick Court, London WC1R 5DP, England)

[Mucins, composed of conjugated carbohydrates and proteins, occur in mucus and saliva and are widely distributed in nature. The mucous membrane is a tissue lining of tubular cavities (such as the gut, uterus, and trachea), and it consists of a layer of epithelium containing many single-celled mucous glands. These glands secrete mucus. Abstractor's note]

Preliminary analysis of the mucus components of salmon were performed relative to secretion of mucus from the epidermis.

Chromatography and further electrophoresis of whole mucus revealed three major components. Continued analysis indicated the presence of mannose, fucose, glucose, galactose, glucosamine, and galactosamine. Protein content of the mucus was 62% of the dry weight; seventeen amino acids were present, with serine, threonine, histidine, glycine, glutamic acid, and aspartic acid predominating. No free thiol groups were present.
[2 figures, 7 references] SW

0.36 FISH LIVER FRUCTOSE 1,6-DIPHOSPHATASE. I. PURIFICATION OF THE ENZYME FROM GENYPTERUS CHILENSIS AND STUDIES ON ADENOSINE 5'-MONOPHOSPHATE INHIBITION

Gonzalez, Ana Maria, Fresia Gonzalez, Sighart Golf, and Frank Marcus (Instituto de Bioquímica, Universidad Austral de Chile, Valdivia, Chile)
Journal of Biological Chemistry 247, No. 19, 6067-6070 (Oct. 10, 1972)

[Fructose 1,6-diphosphate is an intermediate compound in the pathway of the synthesis of glucose from nonglucose precursors such as the compounds resulting from glycolysis, intermediates of the citric acid cycle, several amino acids, and others. This synthesis of glucose is called gluconeogenesis. The enzyme fructose 1,6-diphosphatase, catalyzes the hydrolysis of fructose 1,6-diphosphate in the formation of the next compound in the pathway of gluconeogenesis, fructose 6-phosphate. Since the formation of glucose in this manner is contrary to the mechanisms involved in ongoing glycolysis, a modifying agent is required in the cell to regulate the activity of the enzyme fructose 1,6-diphosphatase. The modifying agent is adenosine 5'-monophosphate (AMP) which reduces the activity of the enzyme and provides part of the mechanisms which regulate all enzyme activities in the cell. Gluconeogenesis occurs mainly in the liver and kidney. (Abstractor's note)]

Other studies have demonstrated that the enzyme fructose 1,6-diphosphatase derived from poikilotherms (animals whose body temperature is close to the environmental temperature) is also inhibited by AMP. However, the enzyme derived from homeotherms (animals with constant body temperatures independent of the environmental temperature) decreases in activity as the temperature is increased.
(over)

0.32 (1.92) FREE AMINO ACID CONTENTS OF THE SKELETAL MUSCLE OF CARP AT JUVENILE AND ADULT STAGES

Siddiqui, A. Qayyum, Anwar H. Siddiqui, Khalida Ahmad (Dept. of Zoology, Aligarh Muslim University, Aligarh, India)
Comparative Biochemistry and Physiology 44, No. 3B, 725-728 (Mar. 15, 1973)

Biochemical composition of muscle tissues, particularly the amino-acid content, of juveniles and adults of three carp species was determined. The skeletal muscle of Labeo rohita (Ham.) Cirrhina mrigala (Ham.), and Catla catla (Ham.) were sampled and homogenized in 80% alcohol. The amino acids were extracted and separated, identified, and quantified by techniques of chromatography and electrophoresis.

Eighteen amino acids were identified; ten of these were essential. Cysteine quantitatively dominated the amino-acids present in the juveniles of L. rohita and C. mrigala. Aspartic acid was the dominant amino acid in juvenile C. catla. In the adults of all three species the following amino acids were found in high concentrations in decreasing order: lysine, glycine, cysteine, aspartic acid, and histidine. Amino-acid levels were lower in muscle of the juveniles than in muscle of the adults. The authors suggest that the difference may be due to active incorporation of amino acids in building tissue and less metabolic breakdown of tissue in the juvenile muscle.
[2 tables, 11 references] SW

0.36

Experiments were performed to compare the activity of the enzyme fructose 1,6-diphosphatase derived from fish liver to the same enzyme derived from rabbit liver. A highly purified enzyme was prepared from the liver of the fish G. chilensis. Tests showed that the enzyme from fish liver responded to AMP, KCl, and temperature in a similar manner as the enzyme derived from rabbit liver. However, the fish-derived enzyme is less sensitive to AMP inhibition than the rabbit-derived enzyme at the same temperature.
[3 figures, 2 tables, 21 references] SW

0.38 TROUT INTESTINAL ALKALINE PHOSPHATASES.
I. PHYSICAL-CHEMICAL CHARACTERISTICS

Whitmore, Donald H., and Erwin Goldberg (Dep. Biol. Sci., Northwest. Univ., Evanston, Ill.)
Chemical Abstracts 77, No. 25, 161422u (Dec. 18, 1972)

0.38 TROUT INTESTINAL ALKALINE PHOSPHATASE.
II. EFFECT OF TEMPERATURE ON ENZYMIC ACTIVITY IN VITRO AND IN VIVO

Whitmore, Donald H., and Erwin Goldberg (Dep. Biol. Sc., Northwest. Univ., Evanston, Ill.)
Chemical Abstracts 77, No. 25, 161421t (Dec. 18, 1972)

0.12 STAINLESS STEEL FOR SALINE-WATER SERVICE

Kopecki, E. S. (American Iron and Steel Institute, 150 E. 42d St., New York, NY 10017)
Chemical Engineering 80, No. 2, 124, 126-128 (Jan. 22, 1973)

Many stainless steels are excellent for salt-solution applications. This article contains a discussion of the experiences gained in various desalting plants. Such information is useful to engineers who have to handle brackish or more concentrated saline waters in plant operations.
[7 figures, 6 references] FTP

0.35 (0.5) NEW ANTIBACTERIAL BROMOIDOLE METABOLITES FROM THE MARINE SPONGE POLYFIBROSPONGIA MAYNARDII

Van Lear, G. E., G. O. Morton, and W. Fulmor (Lederle Laboratories, American Cyanamid Co., Pearl River, NY 10965)
Tetrahedron Letters No. 4, 299-300 (Jan. 1973)

Two new dibromo antibacterial compounds were obtained by aqueous alcohol extraction of the Caribbean sponge P. maynardii. The first is a dibromoaminoalkyl substituted indole. The second is 3-(2-aminoethyl)5,6-dibromo indole.
[4 references] FTP

0.322 (8.51) FREE AMINO ACIDS IN FRESHWATER PLANKTON AND ITS MEDIUM

Jankevicius, K., S. Budriene, A. Baranauskiene, V. Lubianskiene, G. Jankavicliute, T. Kiselyte, and J. Bivainis (Inst. Bot., Vilnius, U.S.S.R.)
Chemical Abstracts 77, No. 17, 111635v (Oct. 23, 1972)

0.118 (7.43) USE OF STRIP-LINE CONFIGURATIONS IN MICROWAVE MOISTURE MEASUREMENT

Kent, M. (Torry Res. Stn., Dep. Trade Ind., Aberdeen, Scotland)
Chemical Abstracts 77, No. 24, 159708y (Dec. 11, 1972)

0.36 (1.88) ANAEROBIC GLUCOSE DEGRADATION IN THE SEA MUSSEL MYTILUS EDULIS L.

De Zwann, Albertus, and Willibrordus J. A. van Marrewijk
Comparative Biochemistry and Physiology 44, No. 2B, 429-439 (Feb. 15, 1973)

In reports from other work, anaerobic degradation of glycogen in sea mussel by specific enzymes was examined. Succinate and alanine accounted for 50% of the total glycogen that was degraded. To identify the other products of anaerobic degradation, experiments were performed on anaerobic metabolism of glucose in the sea mussel.

Mussels were collected from a natural bed on the Netherland's coast and injected with ^{14}C labeled glucose. They were placed in previously boiled sea water; one group was held for 24 hr. and another group was held for 48 hr. The mussels were then homogenized and subjected to a fractionization procedure using solvent extraction, lyophilization, precipitation, filtration, centrifugation, ion exchange, and separation and purification by chromatography. Radioactivities of two major fractions, amino acids and organic acids, were determined.

About half of the isotope ^{14}C was incorporated in four amino acids: alanine, glutamic acid, aspartic acid, and glutamine. Alanine accounted for about 75% of the radioactivity. The organic acids accounted for just over 36% of the radioactivity, and were identified as follows: succinate plus lactate, 52.3%; malate, 14.7%; citrate, 2.2%; fumarate, 2.2%; and pyruvate, 1.0%. The amino acids and organic acids together accounted for 85% of the total radioactivity of the mussel homogenated; the incubation times of 24 and 48 hr. made little difference in the

(over)

0.39 SPECIFIC ROLE OF GLUCOSE IN RAPID LIPOGENIC ACTIVATION IN VIVO

Baker, N., and R. J. Huebotter
Journal of Lipid Research 14, No. 1, 95-101 (Jan. 1973)

The effects of glucose, after fasting, on the synthesis of lipids were investigated. Mice were fed a fat-free diet containing 58% glucose for 3-4 days and then deprived of food for 18-28 hr. before the experiment. One group of mice was injected with ^{14}C-labeled glucose and killed after 30 min. The extent of ^{14}C-incorporation into total lipid fatty acids (TLFA) and all other end products in the carcass was measured. The other fasted mice were divided into three groups and fed ^{14}C-labeled glucose in one of three forms: solid glucose, or a 30% solution, or a fat-free 58% glucose diet. After 40 min., they were killed and their carcasses were analyzed for ^{14}C in TLFA and other products.

The results of the tests indicated that in the mice that were fasted and then injected with ^{14}C-labeled glucose, only a small amount was converted to fatty acids. Most of the glucose was converted to end products such as CO_2 and other metabolic intermediates. In the mice fed the ^{14}C-labeled glucose in meals there was a rapid increase in the conversion to fatty acids. A hyperglycemic response and glycosuria were observed in mice fed solid glucose or glucose in solution. There was a much lower glycemic response in rats fed the 58% glucose fat-free diet. The authors concluded that lipogenesis can be rapidly activated by glucose as the sole dietary constituent.

[3 figures, 3 tables, 27 references] SW

0.39 ACCELERATION BY ECDYSTERONE OF PREMOULT SUBSTAGES IN THE CRAYFISH

Stevenson, J. R., and J. A. Tschantz (Dept. of Biological Sciences, Kent State University, Kent, OH 44242)
Nature 242, No. 5393, 133-134 (Mar. 9, 1973)

[Ecdysterone is a hormone that controls molting in insects and crustacea. In insects the hormone is secreted by the thoracic gland and in crustaceans by the y-gland. Abstractor's note]

If these glands are removed neither of the organisms will molt. If these intact organisms enter the premolt stage, removal of the glands will have no effect on continuation of the molting process. The authors suggest that this hormone acts in several ways in addition to initiating premolt. To elucidate these effects experiments were performed on crayfish with injections of ecdysterone.

The results indicate that the hormone in addition to initiating premolt, caused the crayfish to enter the next molting stage sooner, and continued to stimulate the animal in preparatory activity for the next molt.

[1 table, 25 references] SW

0.4 POSSIBLE MICROBIAL CONTRIBUTION TO NITROSAMINE FORMATION IN SEWAGE AND SOIL

Ayanaba, Abateni, Willy Verstraete, and Martin Alexander (Dept. of Agronomy, Cornell University, Ithaca, NY 14850)
Journal of the National Cancer Institute 50, No. 3, 811-813 (Mar. 1973)

The nitrosamines are reported to be carcinogens in rats; thus, these compounds are cause for concern through possible exposure to them in food, water, or elsewhere in the environment. The nitrosamines may be present in polluted water and soils; the compounds may be assimilated from the soil by food crops. They may appear in waterways after being leached from the soil.

Tests were performed to determine the possibility of nitrosamine formation from sewage and a suitable substrate. Municipal sewage samples were divided into four categories by pH: 4.0, 5.0, 6.0, and 7.0 and incubated at 30° C. on a rotary shaker. Trimethylamine (TMA) and nitrate-nitrogen were added to the cultures and incubation was continued. The results of the tests indicates that the least amount of dimethylamine (DMA) was formed in the cultures adjusted to pH 7.0; the largest amount of nitrate nitrogen was produced at that pH; and the largest amount of dimethyl nitrosamine (DMNA) was produced at the same pH. None of these reactions occurred with filter-sterilized sewage. Forest soil incubated with DMA, glucose, and nitrate-nitrogen also produced DMNA.

The authors concluded that microbial contribution to formation of a nitrosamine in sewage or soil may occur in one of the following routes: (1) by converting tertiary amines or other nitrogen containing compounds to secondary amines;

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0.33 (2.3) ISOLATION AND NUTRITIONAL EVALUATION OF PROTEIN FROM SHRIMP WASTE EFFLUENT

Toma, Ramsis Barsoum (Louisiana State Univ., Baton Rouge, La.)
Chemical Abstracts 78, No. 3, 14734q (Jan. 22, 1973)

0.4

(2) by reduction of nitrate, or oxidation of ammonia to nitrite; and (3) by causing an enzymatic reaction between nitrite and secondary amines. The nitrosamines may be formed nonenzymatically under acid conditions. Nitrosamines have not yet been found in sewage or soil; however, the results of these tests indicate a potential for the formation of such compounds in these environments.
[1 table, 14 references] SW

0.33 (0.36)(6.3) CARBON DIOXIDE FIXATION AND TRANSLOCATION IN BENTHIC MARINE ALGAE. II. TRANSLOCATION OF CARBON-14 LABELED ASSIMILATES IN LAMINARIA HYPERBOREA AND L. SACCHARINA

Schmitz, Klaus, Klaus Luening, and Johannes Willenbrink (Bot. Inst., Univ. Koeln., Cologne, Germany)
Chemical Abstracts 77, No. 17, 111611j (Oct. 23, 1972)

0.39 LEAD-210 IN SELECTED MARINE ORGANISMS

Beasley, Thomas Miles (Oregon State Univ., Corvallis, Oreg.)
Chemical Abstracts 77, No. 15, 98368t (Oct. 9, 1972)

0.36 (1.88)

results except for glutamic acid which were 8.8 and 13.6%, respectively, of the radioactivity in the amino-acid fractions.

The authors believe that the formation of glutamate and succinate is important for the balance of reduced and oxidized coenzymes in the mitochondrion.
[2 figures, 4 tables, 17 references] SW

0.39 EFFECT OF MAGNESIUM ON HORIZONTAL CELL ACTIVITY IN THE SKATE RETINA

Dowling, John E., and Harris Ripps (Depts. of Ophthalmology and Physiology, New York University School of Medicine, New York, NY 10016)
Nature 242, No. 5393, 101-103 (Mar. 9, 1973)

Synaptic transmission between photoreceptors and retinal neurones of vertebrates is chemically controlled (such as by acetylcholine). Other reports indicated that the photoreceptor releases a depolarizing transmitter in the dark and that admission of light decreases the flow of this substance.

In experiments on skate retina horizontal cells, the influence of magnesium on their electrical properties was determined. The results indicate that these cells are in a partially depolarized state in the dark due to the continual release of a depolarizing neurotransmitter from the photoreceptors. The presence of high levels of magnesium decreases the release of neurotransmitter (similar to the response to light) causing the cell to hyperpolarize and prevent light evoked responses. Other workers reported that anoxia and metabolic poisons produced similar effects on horizontal cells. The activity of depolarizing transmitter (secreted by vertebrate photoreceptors) on bipolar cell responses, the authors suggest, is not fully clear. The identity of the photoreceptor neurotransmitter of the skate (a depolarizing agent) has been determined by other workers to be L-glutamate.
[3 figures, 33 references] SW

0.38 EFFECT OF STARVATION ON THE ACTIVITIES OF GLUCOSE 6-PHOSPHATE-METABOLIZING ENZYMES IN FISH

Nagayama, Fumio, Hiroshi Ohshima, Kazutami Umezawa, and Morikazu Kaiho (Tokyo Univ. Fish., Tokyo, Japan)
Chemical Abstracts 77, No. 17, 112850y (Oct. 23, 1972)

0.5 (3.333) SALMON-CANNING WASTE WATER AS A MICROBIAL GROWTH MEDIUM

Strasdine, G. A., and Joanne M. Melville (Fisheries Research Board of Canada, Vancouver Laboratory, Vancouver 8, British Columbia, Canada)
Journal of the Fisheries Research Board of Canada 29, No. 12, 1769-1771 (Dec. 1972)

A useful form of pollution abatement is the conversion of wastes to marketable products through the action of microorganisms and other agents. The waste water from a salmon-canning operation was investigated for possible use as a growth medium for bacteria. The average salmon-canning effluent (SCE) flow from the plant was 1135.5 liters per minute and the total solids content after filtration through glass wool was 1.91 mg. per milliliter. On a dry weight basis, (per mg. of solids) the content of nitrogen was 79.5 mg. and carbohydrates 14.2 mg., of which 28% was free glucose. A medium was prepared consisting of 0.2% dipotassium phosphate, 0.02% magnesium sulfate, 0.002% ferric sulfate, 0.002% manganous sulfate, 0.5% dextrose, and 1.91 mg. SCE (dry weight) per milliliter of medium. The pH of the medium was 7.0-7.1 after sterilization. The growth-promoting capability of this medium was compared to the same medium but with SCE replaced by commercially prepared enzymatic digests of meat, casein, or soya, or acid hydrolyzed casein or soya, or beef extract. Of the six organisms tested, maximum cell yield did not occur in media containing acid hydrolyzed casein or enzymatic digest of soya nor in the medium containing beef extract. SCE medium promoted maximum growth of two organisms: Sorangium 495, and Pseudomonas putrefaciens. The other species showed good growth in SCE medium compared to media with the other sources of nitrogen.

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0.5 (3.3) CONDITIONS NECESSARY FOR STERILITY TESTING OF OF HEAT PROCESSED CANNED FOODS

Evancho, G. M., D. H. Ashton, and E. J. Briskey (Campbell Institute for Food Research, Camden, NJ 08101)
Journal of Food Science 38, No. 2, 185-188 (Feb. 1973)

Sterility testing is used to determine the effectiveness of processing and the integrity of containers. The reliability of the tests depends upon exclusion of contamination during any of the subculture operations. Other workers have reported the necessity of controls in sterility testing of canned foods. They reported that a common laboratory technique such as flaming test tubes could introduce contamination. In addition, long hair has been implicated as the source of contamination in laboratory sterility tests. Experiments were performed on some steps of sterility testing to isolate factors contributing to contamination.

A total of 4,740 cans of 11 different pasta-containing products was obtained from facilities on the east and west coasts and in the Midwest. Cooked meat media (CMM) and brom cresol purple broth (BCP) were used as anaerobic and aerobic media, respectively, after testing to ensure they supported growth. Each can was inspected for external defects. The counter tops were wiped with chlorine solution; the can-end was dipped in alcohol and held over a lighted burner. The can opener was dipped in alcohol and flamed sufficiently to destroy all microorganisms; it was used to make a hole about 2 in. in diameter in the heated end of the can. The contents of the cans were removed with sterile forceps and inoculated into one tube each of CMM and BCP. The contents, odor, and appearance were noted, and the pH

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0.5 A SURVEY OF THE OCCURRENCE OF VIBRIO PARAHAEMOLYTICUS AND V. ALGINOLYTICUS ON MUSSELS AND OYSTERS AND IN ESTUARINE WATERS IN THE NETHERLANDS

Kampelmacher, E. H., Lucretia M. van Noorle Jansen, D. A. A. Mossel, and Frieda J. Groen
Journal of Applied Bacteriology 35, No. 3, 431-438 (Sept. 1972)

Gastroenteritis caused by V. parahaemolyticus has been reported in Japan and the United States in 1971. These reports caused this survey to take place following a survey on the occurrence of the organism in fishery products sold in the Netherlands in 1970. The earlier investigation revealed that 0.25% of 407 samples of fish and crustaceans originating from the North Sea were contaminated with the organism.

Two different enrichment procedures and isolation methods in parallel were employed to obtain reliable results but the authors concluded that biochemical identification of V. parahaemolyticus "remains a difficult task." Pathogenicity tests in fertilized hen eggs [E. H. Kampelmacher and L. M. van Noorle Jansen, Zbl. Bakt. Hyg. I. (1972)] gave a more reliable diagnostic procedure. It consists of inoculating 100-500 viable cells into the yolk sac of eggs previously incubated for 10 days. Five eggs were used per assay, and the number of embryos killed within 72 hr. was used as a criterion of pathogenicity.

Of 288 samples of mussels, and 64 samples of estuarine water examined for V. parahaemolyticus 2.4% and 4.7%, respectively, were positive. The organism was not found in 80 samples of oysters. Of 144 samples of mussels, 44 of oysters, and 36

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0.5 (3.4) AEROBIC MICROBIAL FLORA OF SMOKED SALMON

Lee, J. S., and D. K. Pfeifer (Dept. of Food Science and Technology, Oregon State University, Corvallis, OR 97331)
Journal of Milk and Food Technology 46, No. 3, 143-145 (Mar. 1973)

The essentials of the good manufacturing practice (GMP) [Federal Register 35: 17401-17402. Part 128a, Subpart A. (1970)] for smoked fish are as follows: Hot smoking at 82° C. for 30 min. minimum, if the water phase salt (WPS) of the finished product is 3.5 or above; or smoking at 66° C. for 30 min. if the WPS is at least 5.0; and storage of the smoked fish at 3.3° C. maximum. This treatment is intended to remove the hazard of growth and toxin production of Clostridium botulinum type E. Before the GMP became effective, the authors investigated the microbial flora of smoked salmon from various processors.

Six smoked salmon samples were purchased from retail stores. Blended material from each sample was diluted, plated on agar, and incubated. The isolated colonies on the plates were classified in four general groups: gram-positive cocci, Bacillus, Pseudomonas, and yeasts. The gram-positive cocci were further differentiated into six groups of Staphylococcus and eight groups of Micrococcus.

The results indicated that flora and numbers of the samples were extremely variable. The aerobic bacteria count ranged from 1.3×10^2 to 2.2×10^6 per gram. In addition, the data indicated that five of the samples met the WPS requirements of the GMP at the higher temperature treatment, and three of the samples met the WPS

(over)

0.5

of water examined for V. alginolyticus, 3.5%, 6.8%, and 5.6%, respectively, were positive.

The authors concluded that V. parahaemolyticus inhabits the estuaries and sea water near the coast. In addition, they do not expect illnesses resulting from consuming raw oysters contaminated with the organism; because oysters are kept chilled from harvest to consumption, the organism, being thermotropic, will not grow to numbers that could cause illness. Mussels present no problem because they are cooked or marinated before they are eaten. The hazard lies only in recontamination after heat processing.
[4 tables, 28 references] SW

0.5 (3.333)

PURIFICATION AND CONCENTRATION OF CLOSTRIDIUM BOTULINUM TYPE F TOXOID

Blagoveshchenskii, V. A., L. N. Reshetnikova, T. I. Bulatova, and E. V. Perova (Inst. Epidemiol. Mikrobiol. Im. Gamalei, Moscow, U.S.S.R.)
Chemical Abstracts 78, No. 3, 12440s (Jan. 22, 1973)

0.33 PHYLOGENY OF THE NEUROHYPOPHYSIAL HORMONES, TWO NEW ACTIVE PEPTIDES ISOLATED FROM A CARTILAGINOUS FISH, SQUALUS ACANTHIAS

Acher, Roger, Jacqueline Chauvet, and Marie Therese Chauvet (Lab. Chim. Biol., Univ. Paris VI, Paris, France)
Chemical Abstracts 77, No. 25, 161099u (Dec. 18, 1972)

0.5 (3.4)

of CMP at the lower temperature treatment. The most frequently isolated microorganisms were gram-positive cocci. Pseudomonas species and yeasts were found sporadically which indicated possible contamination after processing. Bacillus species were distributed unevenly among the samples; the presence of these species could indicate underprocessing. S. aureus and S. epidermidis were found in three samples. Human skin was suggested as the origin of these species. Six strains of Micrococcus were isolated from the samples. Organisms of this genus can tolerate 20% NaCl brine but not at 3.3° C, or below specified by GMP. They also are inactivated by the smoking temperatures specified by GMP. The presence of the gram-positive cocci, the authors suggest, could be indicative of temperature abuse of the product; that is, the smoking temperatures or storage temperature specified by GMP may not have been always observed.
[4 tables, 10 references] SW

0.5 FACTORS AFFECTING SURVIVAL OF TEST BACTERIA IN SEA WATER: MARINE BACTERIA, TEST BACTERIA AND SOLID SURFACES

Moebus, K. (Biol. Anst. Helgoland (Meeresstn.), Helgoland, German Federal Republic)
Helgolander Wiss. Meeresunters., 23, No. 3, 271-285 (1972) 21 refs.
Aquatic Sciences & Fisheries Abstracts 3, No. 1, 3Q153M, p. 34 (Jan. 1973)

The antibacterial activity of sea water is variable relative to incubation of successive inocula of Escherichia coli, Staphylococcus aureus, and Serratia marinorubra. Incubation of second inocula was inhibited in most cases except for S. aureus. The inactivated cells of E. coli and S. aureus strengthened the bactericidal effect of filter-sterilized sea water. The bactericidal effects of autoclaved sea water were not conclusive. The bactericidal effects of sterile filtered and raw sea water were enhanced against E. coli and S. aureus on higher surface to volume ratios of solid surfaces than lower ratios. Changes in nutritive conditions were found to be more effective in the antibacterial activity of sea water than the excretions of marine bacteria. SW

0.5 (3.3)

of the product was measured. Then the cans were emptied, washed, and saved until incubation of cultures was complete. If cultures showed growth, the corresponding can was tested for ability to maintain a vacuum and then torn down to be examined for defects.

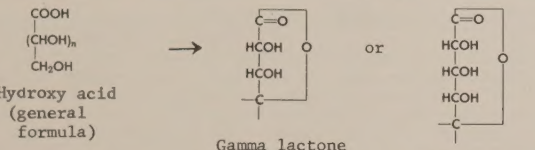
In almost all cases where growth occurred, either the CMM tube or the BCP tube was positive, but not both from the same sample. The organisms were found to be either species used for tests in the laboratory or cocci found on human beings.

The authors suggested that sterility tests be conducted in a room under positive air pressure by operators wearing sterile head covers, face masks, and lab jackets after having all exposed body surfaces washed with antiseptic soap.
[3 tables, 10 references] MS

0.6 DELTA-LACTONES IN FLAVOURING

Als, Gert (Grindstedvaerket A/S Laboratory for Food Additives, Brabrand, Denmark)
Food Manufacture 48, No. 1, 31-32 (Jan. 1973)

[Hydroxy acids tend to form inner esters or lactones in the following manner:



Hydroxy acid (general formula)

Gamma lactone (5 member ring)

Delta lactone (6 member ring)

Generalized equation

Abstractor's note]

Reports from other work indicated that lactones occur naturally in fatty foods and are important in imparting flavor. Examination of various foods indicated that delta lactones are present in butterfat, beef fat, and heated pork fat, in addition to fats from other animals. The occurrence of delta lactone is due to the presence of delta hydroxy fatty acids in the triglycerides of the animal

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0.7 (5.2) THIAMINE MODIFYING PROPERTIES OF HEME PROTEINS FROM SKIPJACK TUNA, PORK, AND BEEF

Porzio, Michael A., Nora Tang, and Doris M. Hilker (Dept. of Food and Nutritional Sciences, University of Hawaii, Honolulu, HI 96822)
Journal of Agricultural and Food Chemistry 21, No. 2, 308-310 (Mar.-Apr. 1973)

Earlier work has shown that some Pacific fish contain a thermostable (non-enzymic) antithiamine activity. The present study examined the thiamine-modifying properties of heme protein fractions of skipjack tuna, beef, and pork.

The thiamine modifying factors of the dark red muscle (blood channel) of the skipjack tuna were concentrated in the protein fractions that were precipitated at 70% and 80% saturation with $(NH_4)_2SO_4$ at pH 6.8. The major constituents of these fractions were myoglobin and hemoglobin. The thiamine modifying property of the skipjack tuna myoglobin and hemoglobin was similar to that of commercial samples of equine myoglobin and bovine hemoglobin. Beef and pork also contained thiamine modifying factor that was associated with the fractions precipitated at 70% and 80% $(NH_4)_2SO_4$. Skipjack tuna light muscle showed thiamine modifying factor that was spread throughout the fractions precipitated from 30% to 80% $(NH_4)_2SO_4$ saturation.
[2 figures, 2 tables, 13 references] FTP

0.6 NITRITE, NITROSAMINES AND CANCER

Aune, T. (Dept. of Pathology, Sentralsykehuset i Trondheim, Norway)
Nordisk Veterinaermedicin 24, Nos. 7/8, 356-369 (1972) (In English)
Food Science and Technology Abstracts 4, No. 12, 12C293, 11 (Dec. 1972)

Nitrites are found in various kinds of food: milk; fresh meat; flour and baked products; fresh, frozen, and canned fruits and vegetables; cheese; fresh and canned fish; smoked fish, sausages, and ham. Results of a survey of various meat products in Norway indicated that the concentrations of nitrite were relatively high. In salami, concentration of nitrites was 73.6 p.p.m., luncheon meat--76.0 p.p.m., liver pâté--20.0 p.p.m., hot dogs--14.5 p.p.m., bacon--13.0 p.p.m., and smoked salmon--130.0 p.p.m. Since carcinogenic nitrosamines can be synthesized through interaction of ingested nitrites and amines in foods or drugs, the author suggested that the addition of nitrite to food should be reduced or prohibited. The Norwegian Health Department has prohibited the use of nitrate and nitrite as additives to food after January 1, 1973, except by special permission.
[47 references] SW

0.7 FAT VERSUS SUCROSE AS THE NONPROTEIN CALORIE PORTION OF THE DIET OF RATS

Dror, Yosef, Humphrey F. Sassoon, Julia J. Watson, Donald O. Mack, and B. Connor Johnson
Journal of Nutrition 103, No. 3, 342-346 (Mar. 1973)

The possibility that calories from dietary fat are metabolically superior to calories derived from carbohydrates has been discussed and investigated by other workers for many years. To find new information on the subject, diets with a ratio of protein to nonprotein calories of 1:4 were used to compare the effects of sucrose and lard on protein retention.

Three-month-old male rats were fed two different diets. One group was fed (in grams per 100 grams of diet) 69, sucrose; 5, corn oil; 20, casein; and 6, minerals plus vitamins; another group was fed a diet containing (in the same proportions) 51, lard; 8, corn oil; 33, casein; and 8, minerals plus vitamins. The two groups of rats were fed for 13 days. In the last 2 days, they were placed in metabolism cages to determine nitrogen balances.

The results of the study indicated that the rats on the lard diet had a better nitrogen economy than the rats on the sucrose diet in terms of intake, thrift, protein utilization, and energy utilization. At the end of the balance study each rat received, intravenously, radioactive L-arginine and L-leucine; groups of rats were killed 3, 12, or 24 hr. later. Measurement of the two amino acids incorporated into liver protein indicated increased L-arginine uptake in rats on the fat diet.

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0.110 SENSORY LABORATORY -- A BASIC PREREQUISITE FOR FOOD RESEARCH
(0.6)(8.8)

Neumann, R., and S. Arnold
Lebensmittel-Ind. 19, No. 9, 367-370 (1972) (In German; English summary)
Food R.A. Abstracts 26, No. 1, Abstract No. 245, 39 (Jan. 1973)

The basic requirements for a room in which taste tests are carried out are given. The article is illustrated with photographs of suitable facilities. R.A.
Reprinted

0.6 EFFECT OF REFRIGERATIVE STORAGE AND HEAT TREATMENT ON LIPIDS IN SQUID
(1.89)

Shchenikova, N. V. (Mosk. Inst. Nar. Khoz., im. Plekhanova, Moscow, U.S.S.R.)
Chemical Abstracts 78, No. 1, 2860q (Jan. 8, 1973)

0.7

The authors concluded that an improved protein utilization and nutritional status was obtained in the rats when the high fat, carbohydrate-free diet was fed.
[3 tables, 24 references] SW

0.5 TAXONOMY OF MARINE BACTERIA: BENECKEA PARAHAEMOLYTICA AND BENECKEA ALGINOLYTICA

Bauman, Paul, Linda Bauman, and John L. Reichelt (Dept. of Microbiology, University of Hawaii, Honolulu, HI 96822)
Journal of Bacteriology 113, No. 3, 1144-1155 (Mar. 1973)

The purpose of this study was to characterize certain strains of human pathogens having the properties of the genus Beneckea and to submit the data to numerical analysis. One hundred and sixty-nine strains, including 91 strains from cases of gastroenteritis and 41 from localized tissue infections and ear and eye infections, were submitted to extensive nutritional, physiological, and morphological characterization. On the basis of phenotypic differences, the data showed that the strains could be placed into species B. parahaemolyticа, B. alginolyticа, and a distinct, undesignated group. Furthermore, these species and group could be separated from the other species and groups of the genus Beneckea by multiple, unrelated, phenotypic traits.
[1 figure, 3 tables, 36 references] FTP

0.6

fats. When heated or stored at room temperature, the delta hydroxy fatty acids are liberated from the triglycerides and spontaneously form delta lactones.

Synthetic delta lactones were first produced in 1952. The following lactones are now available: delta octa (C_8), nona (C_9), deca (C_{10}), undeca (C_{11}), dodeca (C_{12}), and tetradecalactone (C_{14}). These synthetic delta lactones are important for improving the odor and taste of foods that have reduced or no animal fats in their composition. The changes in the diets of the people in developed countries require less calories, more polyunsaturated fatty acids (usually of vegetable origin), and soya protein (rather than animal protein). Foods made under these conditions will require more delta lactones to enhance added flavors.
[1 table, 13 references] SW

0.6 ACCELERATORS IN FERMENTATION
(0.39)

Takeuchi, Mitsuharu, Toru Kawasaki, Yasuo Koyama, Akio Kurosawa, and Shiro Kayahara (pat.)
Japanese Patent 72/38192 (Sep. 27, 1972)
Chemical Abstracts 78, No. 1, 2765n (Jan. 8, 1973)

0.7 EFFECTS OF DIETARY PROTEIN CONTENT AND RATIO OF FAT TO CARBOHYDRATE CALORIES ON ENERGY METABOLISM AND BODY COMPOSITION OF GROWING RATS

Hartsook, E. W., T. V. Hershberger, and J. C. M. Nee (Nutritional Laboratories, Department of Animal Science, Pennsylvania State University, University Park, PA 16802)
Journal of Nutrition 103, No. 2, 167-178 (Feb. 1973)

Relationships among dietary protein, fat and carbohydrate were investigated in a modeling experiment using male rats and isocaloric diets factorially arranged to describe outcome responses of diets varying in protein content from 6 to 70% and in fat to carbohydrate calories ("ratio") from 0.2 to 1.4. Regression of body weight, weight gain and carcass dry matter, nitrogen and ash gain on protein and "ratio" was described by linear and quadratic coefficients for protein. Energy gain was optimal at 37.3% protein. Maximum quantities of heat of basal metabolism occurred at a dietary composition of 38.5% protein, 42.6% carbohydrate and 12.9% fat. Fecal and urinary nitrogen increased as dietary protein increased, but decreased as "ratio" increased. Body nitrogen gain, unaffected by "ratio," was maximal at 44% dietary protein. Digested energy and metabolized energy were unaffected by "ratio" at 40% protein, but at low and high protein, the effect of "ratio" was negative and positive, respectively. Heat production was constant at a "ratio" of 1.4; below and above 36% protein it was increased and decreased, respectively, by lower "ratios." Heat increment, unaffected by "ratio," was minimal at 46% dietary protein. Significance of this model to human and animal nutrition is discussed.
[10 figures, 7 tables, 42 references] Authors' abstract

0.8 (9.11) HANDBOOK OF OCEANOGRAPHIC ENGINEERING MATERIALS
VOLUME I -- METALS AND ALLOYS

Dexter, Stephen C. (Woods Hole Oceanographic Institution, Woods Hole, MA 02543)
Technical Memorandum WHOI-4-72, 89 pp. (Dec. 1972). Woods Hole Oceanographic Institution, Woods Hole, MA 02543.

This handbook of oceanographic engineering materials is limited to those materials that may be used advantageously in the marine environment. It is intended as an aid to oceanographic engineers and designers in the selection of materials. The complete handbook will cover two volumes; volume I deals with metals and alloys and volume II will deal with nonmetallic materials. Part A of this volume I contains a series of tabulations of metallic materials ranked according to selected mechanical and physical properties, corrosion resistance, and cost. Part B consists of more detailed data on each of the metals and alloys covered. These data relate to composition, mechanical and physical properties, corrosion resistance, forms available, fabricability, typical uses, and base cost. The materials are grouped into alloy classes according to the base metal of the alloy and include: aluminum alloys, copper alloys, nickel alloys, steels, stainless steels, titanium, magnesium, and zinc. FTP

0.8 (9.19) INDUSTRIAL WATER PRETREATMENT

Seels, Frank H. (Water Management Div., Calgon Corp., Box 1346, Pittsburgh, PA 15230)
Chemical Engineering, Deskbook Issue, 80, No. 5, 27-32 (Feb. 26, 1973)

The purpose of water pretreatment is to remove selected impurities such as suspended solids and scale-causing minerals or to adjust pH before the water enters industrial operations. A knowledge of the quality of the water supply is necessary to be able to apply the correct pretreatment techniques. A description of the basic forms of pretreatment follow.

Clarification is a form of pretreatment which involves removal of color and suspended solids from water. When chemical coagulants are used in pretreatment, limits on water velocity and turbulence are required. Lime softening (softening by chemical precipitation) is a pretreatment that removes calcium, magnesium, and bicarbonate ions. This step can be combined with clarification to remove the precipitates. Depending on the amounts of iron and manganese in the water supply, these ions may require special treatment for removal. If the amounts are below 0.5 p.p.m., lime softening is able to remove them.

Chlorination is a pretreatment useful in oxidizing organic material before water enters the clarification step. Chlorination before filtration of water prevents organisms from fouling the filter bed. Chlorination after filtration protects the water distribution system from organisms that could cause corrosion.

Filtration follows clarification and other treatment processes to remove any remaining solids.

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0.8 (0.12) SELECTING FANS AND BLOWERS

Pollak, Robert (Bechtel, Inc., Refinery and Chemical Div., P.O. Box 3965, San Francisco, CA 94119)
Chemical Engineering 80, No. 2, 86-100 (Jan. 22, 1973)

This article describes the commercially available types of fans and blowers and indicates the factors that should be considered in their selection, maintenance, and installation. The information should be useful in the selection of the most adequate unit for a particular need.

Fans and blowers are classified as follows:

The word "fan" is intended to mean a machine that produces pressure rises up to 2 p.s.i.g. The term "blower" is used to describe a machine with pressure rise from 2 to 10 p.s.i.g. The term "compressor" is used for a machine with discharge pressures higher than 10 p.s.i.g.

Fans are classed as axial (where air or gas moves parallel to the axis of rotation) or centrifugal (where air or gas moves perpendicular to the axis). Axial-flow fans are normally used for low-resistance applications--they can move large quantities of air at low pressure. Centrifugal-flow fans are used in applications where the moving air encounters high frictional resistance. Centrifugal-flow fans are classed by blade configuration: radial, forward-curved, backward-curved or inclined, and airfoil.

Blowers are single-stage, high-speed machines, or multistage units that operate at pressures just below, or in the range of, compressors. A blower may also

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0.9 (9.3) THE ROLE OF BASIC RESEARCH IN THE TOTAL R & D PROCESS

Bryan, Glen L. (Psychological Sciences Div., Office of Naval Research, Washington, D.C.)
Research Management 16, No. 1, 29-33 (Jan. 1973)

The role of basic research and the nature of its contributions to the research, development, test, and evaluation (RDT & E) processes depend upon the organizational pattern of the total research and development (R & D) system. In this paper, the author differentiates five different descriptive models of the RDT & E process and indicates the type of contribution that basic research is called upon to make in each model. These models are found in the Department of Defense, but some of them might be found in industrial R & D operations.

Of the five organizational systems analyzed, the author believes the organic model offers the best environment. The organic model is symbolized by the sketch of a tree; the tree was selected simply because it is a living organism. Therefore, there exists a dynamic equilibrium and mutual dependence among its component parts. Each component part has a specialized function, and it cannot substitute for another part. Furthermore, each component part is vital to the vigor and productivity of the entire organism. Fundamental research is represented by the roots of the tree; the roots of the tree provide the basis for the whole tree. Also, because the roots come before the rest of the tree, they have to exist before the rest of the tree does. For these and other obvious reasons, the author draws a parallel between the role of the roots of a tree and the role of basic research.

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0.8 (0.12)

be a rotary (positive-displacement) compressor that can handle relatively low air flows at high compression ratios.

Reprints of this report are available at a price of $2.00 per copy. Request for reprints should be addressed to Chemical Engineering, International Data Processing Center, 121 South Gertrude Ave., Paramus, NJ 07652, U.S.A. Refer to Reader Service Number 173.

[19 figures, 4 tables, 15 references] FTP

0.9 (9.3)

The organic model does not have the strictness of a production chart, but it does emphasize the interactive and interdependent nature of RDT & E. It admits, too, that every really important problem should be worked on at all RDT & E levels simultaneously. The organic model has the greatest flexibility and the greatest opportunity for fundamental research to prosper.

[6 figures] FTP

0.39 (1.92) IMPORTANCE OF PURINE METABOLISM IN UREA BIOSYNTHESIS IN CARP (CYPRINUS CARPIO)

Vellas, F., Y. Creach, and M. Dassain (Lab. Ecophysiol. Anim., Univ. Paul-Sabatier, Toulouse, France)
Chemical Abstracts 78, No. 1, 2167u (Jan. 8, 1973)

0.8 (9.16) EVAPORATION CONTROL ON WATER RESERVOIRS

Dressler, Russell G. (Trinity University, San Antionio, TX 78212), and E. Guinat (Shamtan Lubricants and Chemicals, L.T.D., Tel-Aviv, Israel)
Product R & D 12, No. 1, 80-82 (Mar. 1973)

Scientists have been seeking a practical method for applying monomolecular films to reservoirs in order to control evaporation of water. A patent (U.S. No. 2,903,330) discloses the application of C_{12}-C_{20} fatty alcohols on reservoir surfaces in the form of aqueous suspensions or emulsions, with or without emulsifying or suspending agents. The present report contains descriptions of the suspension process for applying films, development of the equipment, small and large scale trials in the United States, and demonstration trials in Israel. The report covers design of equipment and the procedure for full-scale application of monomolecular films by the suspension process on two lakes of 200-700 acres in Israel. The objectives were to determine the general feasibility of the method, and the critical wind speeds and other factors that may affect or disrupt the continuous film cover. It was possible to maintain a high degree of film coverage for long periods. On a lake of 700 acres, the critical wind speed was 15.5 m.p.h. (above which it is unfeasible to maintain the lake cover).

[18 references] FTP

0.8 (9.19)

Adsorption removes dissolved organic materials principally through the use of activated carbon. It also dechlorinates the water before entering an ion exchange unit which could be damaged by chlorine residues.

Reverse osmosis may be used for desalting sea water. The process uses pressure to force raw water through a semipermeable membrane of a selected pore size. It is possible to remove molecules from the water that are larger than the membrane pore.

All of these water treatments accumulate residues of spent chemicals or clogged filters which may be highly acid or alkiline and persistent and may present problems of disposal without damage to the environment.

[6 figures, 2 tables, 14 references] SW

0.9 (9.3) GEARING INDUSTRIAL R & D TO THE CHALLENGES OF THE 70'S

Anderson, Charles A. (Stanford Research Institute)
Research Management 16, No. 1, 6-9 (Jan. 1973)

Actions taken at the national level to revitalize industrial research have lacked the scope and committment needed to solve our present and long-term problems. However, economic realities are creating a growing awareness of the vital importance of maintaining our technological lead, and broad societal problems have emphasized the need for more technology. The author believes that our government should take steps to improve the climate for R & D, and he suggests some initiatives and approaches that might be taken. These are: (1) Create a system of tax incentives to encourage increased investments in R & D, (2) Relax antitrust prohibitions against appropriate forms of cooperation in R & D, and (3) Contract directly with industry for the R & D needed to solve major national problems. He believes that the government will create a scientific-industrial complex that will make possible achievements in other fields equal to those of our space program.

FTP

0.9 WHERE R & D MANAGEMENT DEVELOPMENT HAS FAILED

Moore, Richard F. (Microelectronics Division, National Cash Register Co.)
Research Management 16, No. 1, 22-25 (Jan. 1973)

The author states that management training and development in industrial R & D organizations is largely a mirage. In his opinion the average new R & D manager, and some experienced managers, are characterized as follows: (1) undertrained in the philosphy and operating principles of management, (2) underdelegated relative to authority, (3) overstretched span of accountability, (4) represented frequently as the best technical expertise in the group, and (5) confused as to how to use the output of the behavioral sciences. Ten areas in which improvements are needed are: (1) Expanded effort must be brought to bear in the study of human resource management; (2) Project successes and failures should be analyzed for common and uncommon denominators in order to adjust the management environment as necessary; (3) Management profiles of the strengths and weaknesses of key, young managers, require further study as a basis for the organization of self-development programs; (4) To improve communication and understanding, management development specialists should be assigned in a staff capacity to the line managers for a period of time prior to joining the management development staff; (5) Improved communication of work environment, responsibilities, and accountabilities to wives of managers are needed; (6) A new look should be taken at techniques for slowing the accelerating technical obsolescence of managers; (7) The concept of key manager job rotation internal and external to R & D should be exploited as a source of managers with broad perspectives; (8) Regular, off-site peer management learning groups should be

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0.9 (9.7) MEASURING THE PERFORMANCE OF RESEARCHERS

Edwards, Shirley A., and Michael W. McCarrey (Organizational Psychology Research Division, Personnel Psychology Service and Research Centre, Public Service Commission, Ottawa, Canada)
Research Management 16, No. 1, 34-41 (Jan. 1973)

A review was made of studies on the measurement of scientific performance. Little agreement exists as to what constitutes scientific output or as to what measures should be used as an index of the output. The few in-depth studies of scientific performance revealed that scientific output is multidimensional and cannot be satisfactorily measured by any one criterion alone. Some of the unresolved questions relating to measures of scientific performance are: (1) Are authors' positions of any value in determining a scientist's written output? (2) How should the quality of a scientist's work be measured; what is the relationship between quality and quantity? (3) What is the value of citation counts? (4) In what way does the creativity or originality of a scientist's work relate to other measures?

For the evaluation of scientific performance, there is need for more intensive investigations into the nature of scientists' contributions to their organizations and to their professions, and also to the scientific community at large.
[52 references]

FTP

1.013 AN EVALUATION OF THE PRESENT LEVELS OF EXPLOITATION OF THE FISHERY RESOURCES OF VENEZUELA

Griffiths, Raymond C., and John G. Simpson
Serie Recursos y Explotacion Pesqueros 2, No. 5, 52 pp. (1972) (Ministerio de Agricultura y Cría, Oficina Nacional de Pesca, República de Venezuela, Caracas, Venezuela) [In Spanish and in English]

The fishery resources off Venezuela are described based on information collected during the past 5 years by the Ministry of Agriculture/United Nations Development Program/Food and Agriculture Organization Fisheries Development Project. Present catch levels and recent historical trends in the catches of the most important species or groups of species are discussed. Also, preliminary stock assessments were made for those fisheries in which adequate data were available on fishing effort.

The sardine fishery seems to be stabilized at about an annual catch of 40,000 tons. The trawl fisheries has about reached the level of maximum sustainable yields; this fishery includes predominantly the shrimps, grunts, curvinas, and croakers. The yellowfin and albacore tuna are probably being overfished. The rest of the resources are being exploited by the artisanal fisheries and probably could be further developed.
[1 figure, 23 tables, 46 references]

FTP

0.9 (9.2) CONTROLLING STAFF AGE, AND FLEXIBLE RETIREMENT PLANS

Decker, W. D., and C. M. Van Atta (Lawrence Livermore Laboratory, University of California)
Research Management 16, No. 1, 16-21 (Jan. 1973)

The authors state that average age and age distribution importantly affect the vitality and output of an R & D staff. They suggest effective turnover practices and a flexible early retirement plan to help produce a desirable age mix.

Results of their review of the literature and interviews with responsible research managers revealed that: (1) Creativity generally diminishes after the age of 35 or 40; (2) Total value of an individual to the organization may continue to improve due to experience and judgement; and (3) Persons with leadership potential move into management positions and are subsequently judged in that role. However, performance and responsiveness of aging professional employees varies over a wide range so that flexibility in management (rather than fixed rules) is required. Given a stimulating atmosphere, highly movitated professional employees generally maintain their creativity and productivity up to the normal retirement age.

A successful, flexible retirement plan should provide for 60% of the average high-three year salary for 30 years of service. However, the annuity as a percentage of the average high-three salary should increase only slowly with each year of service--between 2 and 2.5% per year. Such a plan would provide an adequate annuity for most employees retiring at age 55 and little incentive for late retirement for the marginal employee.
[5 figures, 3 tables, 4 references] FTP

1.121 [ALBACORE FISHING IN (THE) ATLANTIC]
LA PÊCHE A L'ALBACORE DANS L'ATLANTIQUE

Fonteneau, A. (ORSTOM, Abidjan, Ivory Coast, Africa)
Fr. Pêche, 173, pp. 36-39 (1972) (In French)
Aquatic Sciences & Fisheries Abstracts 3, No. 1, 3Q819M, p. 181 (Jan. 1973)

The present state and prospects for the Atlantic albacore fishery were evaluated. Yield of fish is falling in contrast to greatly increased fishing effort over the last 3 years by large French, Spanish, and American seiners. Younger fish are caught in the increased effort. It was shown that yields would be increased if fish below 2 years old and adults were not caught. These actions would allow more recruits to enter the fishery. Quota systems to limit catch size and minimum fish size limit would increase fish population. Exploitation of other species could allow expansion of the fishery. SW

0.9 TECHNICIANS AND SUPPORT PERSONNEL -- HOW MANY?

Cuthbert, F. L., and S. Blinder (Research and Development, NL Laboratories, Inc.)
Research Management 16, No. 1, 26-28 (Jan. 1973)

Technicians and support personnel are a vital part of a research organization. Having the right number of such personnel in relation to the size of the professional staff has a bearing on how efficiently the organization operates. The optimum ratio of professionals to nonprofessionals must be resolved by each research manager to meet his own particular requirements. The authors made a study of the distribution of personnel in the three job function categories (professionals, technicians, support personnel) in 92 industrial companies. Such information on what is typical in R & D organizations may be of value to the research manager. Data on the ratios of professionals to nonprofessionals in all the companies surveyed and in three selected industrial categories are given in the table that follows.

Industry	Ratio of professional to technicians (Median)	Ratio of professionals and technicians to support personnel (Median)
All 92 companies	1.205	3.725
Chemicals & allied products (24 companies)	1.33	4.065
Petroleum refining (13 companies)	1.31	3.00
Primary metals (10 companies)	1.015	4.505

[2 figures, 3 tables] FTP

0.9

extended as a means for cross fertilization of problem oriented management; (9) Industrial and academic science groups should seek to achieve a closer mutual understanding of management problems and areas of need; and (10) Examine the feasibility of individual managers playing a direct role in periodically modifying their own position descriptions.
[2 references] FTP

2.05 TOXICITY OF HALOGENATED OXYQUINOLINES TO DOGS. EFFECT OF FEEDING FOULED HERRING

Lannek, Birgitta, Paul Lindberg (Med. Dep. I, R. Vet. Coll., Stockholm, Sweden)
Chemical Abstracts 78, No. 1, 1037q (Jan. 8, 1973)

1.951 DISTRIBUTION AND ABUNDANCE OF NEW ZEALAND FUR SEALS ON THE SNARES ISLANDS, NEW ZEALAND

Crawley, M. C. (Zoology Dept., University of Canterbury, Ilam, Christchurch, New Zealand)
New Zealand Journal of Marine and Freshwater Research 6, Nos. 1-2, 115-126 (June 1972)

New Zealand fur seals were once abundant on the rocky shores of New Zealand and the sub-Antarctic Islands, but in the early 19th century commercial sealing almost exterminated the herds. The New Zealand Government regulated, sporadically, the taking of the remaining animals from 1875 to 1946. Since then no seals have been killed legally. Under protection, the seals are thought to be increasing. To determine the distribution and abundance of seals, studies were carried out by the 1970-71 University of Canterbury Snares Islands Expedition.

There were 1,156 seals, excluding pups, on the main island counted in late November 1970. The greatest number of seals on the shore were counted between the hours 1200 and 1500 daily.

Rookeries were widely but discontinuously distributed only on the boulder beaches of the west and southwest coasts of the main island. Breeding bulls defended territories containing, on the average, three females. The first pup was seen on November 30, and when pupping appeared to end, there were 234 pups counted on December 30, 1970.

Nonbreeding seals gathered on rocky headlands, points, and spurs mainly on the east coast of the main island.

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2.01 (0.5) VOLATILE COMPOUNDS PRODUCED IN STERILE FISH MUSCLE (SEBASTES MELANOPS) BY PSEUDOMONAS PEROLENS

Miller, A., III, R. A. Scanlan, J. S. Lee, L. M. Libbey, and M. E. Morgan (Dept. of Food Science and Technology, Oregon State University, Corvallis, OR 97331)
Applied Microbiology 25, No. 2, 257-261 (Feb. 1973)

Earlier, various research workers described a musty, potatolike odor arising from chilled fish muscle during the early stages of spoilage. The organism causing the odor was P. perolens, a psychrophilic organism. The purpose of the present study was to identify the volatile compounds produced in sterile fish (black rockfish, S. melanops) muscle by P. perolens. Of particular interest were the compounds that were responsible for the musty, potatolike odor.

The volatile compounds were identified by use of combined gas-liquid chromatography and mass spectrometry. The compounds positively identified were: methyl mercaptan, dimethyl disulfide, dimethyl trisulfide, 3-methyl-1-butanol, butanone, and 2-methoxy-3-isopropylpyrazine. The compounds identified tentatively were: 1-penten-3-ol and 2-methoxy-3-sec-butylpyrazine. The compound that was found to be primarily responsible for the musty, potatolike odor produced by P. perolens was 2-methoxy-3-isopropylpyrazine.
[3 figures, 24 references]

FTP

1.951 PINNIPEDS OF THE NORTH PACIFIC

Arsen'ev, V. A. (All-Union Research Institute of Marine Fisheries and Oceanography, U.S.S.R.), and K. I. Panin
Israel Program for Scientific Translations, Jerusalem, Israel (1971), 274 pp. (Translated from Russian)

In 1957 the U.S.S.R., the United States, Canada, and Japan entered into an agreement called Convention for the Conservation of the North Pacific Fur Seal. This agreement regulated the catch of the fur seal and established a commission to coordinate research programs of the party nations. The purpose of the research is to maintain optimum population with maximum permissible exploitation. The 1957 convention was instrumental in restoring the herds of seal that had been nearly exterminated in the North Pacific.

The research efforts established by the convention were originally reported in 10 different Russian publications. In the field of biology, articles include population dynamics, determination of stocks, and morphology of fur and other seals. Other articles cover damage caused by sea lions and data on depleted sea otters. In addition, there are articles on primary processing of seal skins, and methods of increasing the value of the product.

SW

2.1121 DESIGN OF TRAWLS: PART 5. BEAM TRAWLS

Buckingham, Harry
World Fishing 22, No. 2, 48-49 (Feb. 1973)

The beam trawl was commonly used in the last century for inshore fishing by sailing smacks. The low-water resistance of the beam trawl made it possible to be towed by sail powered vessels. The introduction of steam power and the otter trawl caused the beam trawl to be confined to small inshore boats fishing for shrimp and flatfish.

The beam trawl is fixed in the open position by a heavy, wide frame. The size of the beam can vary relative to vessel characteristics and depth to be fished. Because this gear is so heavy, it sinks quickly and stays on the bottom. The Belgian and Dutch fishermen have adapted it to modern, powerful fishing vessels, towing a trawl from both sides, "double rig." Double-rig fishing is hazardous, because it can cause a boat to broach-to in a strong wind or tide before compensating adjustments can be applied to rigging arrangements.

The beam trawl design presented in the article is 20 ft. in length with a 70 mm. mesh net, for fishing mainly for sole. The plans for the net sections and the rigging are provided with directions for fabrication of the parts.
[3 diagrams, 1 photograph]

SW

2.110 UNDERWATER PHOTOGRAPHY IN FISHERIES RESEARCH

Hemmings, C. C. (Marine Laboratory, Aberdeen, Scotland)
Journal du Conseil 34, No. 3, 466-484 (Oct. 1972) (Copenhagen, Denmark)

Underwater photography has been used as a tool in fisheries research for the past 25 years. However, the information on the action of gear and fish tends to be provided by acoustic instrumentation. The fundamental requirement for photography is that light radiating from the object be of an intensity and within a spectrum that can cause an adequate response on the film emulsion. Sunlight is attenuated by absorption and scattering in water, and photography by natural light is almost impossible at depths below 30 m. The attenuation of contrast with increased depth and distance from the object prevent the making of a clear photograph. The solution to the problem is the selection of films with light characteristics that will increase contrast with the available light.

The article covers the problems of contrast, illumination, optical distortion, camera mounting, and photographic information content, with references.

The author suggests that trials of cameras and other equipment should be performed in shallow water to familiarize the photographer with the capabilities and problems of underwater photography.

[8 figures, 1 table, 32 references] SW

2.1128 PLASTIC LOBSTER TRAP

Jalbert, Donald A. (137 N.E. Washington St., Barthlesville, Okla.) (pat.)
U.S. Patent 3,708,905
Official Gazette of the U.S. Patent Office 906, No. 2, 397 (Jan. 9, 1973)

The lobster trap is formed by six planar panels, which consist of plastic frames having spaced plastic strips mounted thereon. FTP

1.951

These counts made during the expedition can now be used as a reference for comparison with future abundance studies. If the herds increase, interest in the possibility of fur seal harvest may increase, and managing bodies will have sound estimates of population based on these counts.

[2 figures, 2 tables, 19 references] SW

2.06 PRODUCTION OF FISHERIES PRODUCTS

Ronsivalli, Louis J., Lawrence Learson, and Robert J. Learson; assignors to the United States of America (pat.)
U.S. Patent 3,712,821 (Jan. 23, 1973)

Presently undesirable species of fish, shellfish and crustaceans and process-degraded flesh fractions therefrom are reconstituted to form a highly desirable food product having characteristics of natural fisheries products. These reconstituted products will withstand heat sterilization, refrigerated storage, and subsequent cooking without crumbling. Authors' abstract

2.06 FISH FILLET PRODUCT AND METHOD FOR MAKING
Joaquin, Jean (2 Niven Way, Larkspur, CA 94939) (pat.)
U.S. Patent 3,718,481
Official Gazette of the U.S. Patent Office 907, No. 4, 1021 (Feb. 27, 1973)
The product consists of stuffing material sealed between two fillets (from flat-type fish). FTP

2.112 FISH NET PRESERVATIVES WITH LOW TOXICITY TO FISH
Oda, Satoru, and Hironobu Yada (Yoshitomi Pharmaceutical Ltd.) (pat.)
Japanese Patent 71 43,716 (Dec. 24, 1971)
Chemical Abstracts 78, No. 1, 1051q (Jan. 8, 1973)

1.89 BIOLOGICAL PROTEIN VALUE OF FRESH AND CANNED OCTOPUS, (3.39) CUTTLEFISH, FLYING SQUID, AND SEA SQUID
Pujol, Amparo, and Julia Navio (Esc. Bromatol., Univ. Complutense, Madrid, Spain)
Chemical Abstracts 78, No. 1, 3087e (Jan. 8, 1973)

2.114 (2.118) INSTALLATION FOR THE PRESERVATION OF FISH ESPECIALLY ON BOARD FISHING BOATS

Regnier, Paul (Dieppe, France); assignor to Ateliers & Chantier de la Manche, Dieppe, France (pat.)
U.S. Patent 3,717,123
Official Gazette of the U.S. Patent Office 907, No. 3, 677 (Feb. 20, 1973)

This is a refrigerated brine system for preserving fish. It is equipped with a heat exchanger to cool the liquid, a device to circulate the brine, and a filter to remove fish scales and other solid foreign matter. FTP

2.1471 (2.1475) ARE FISH EXHAUSTED DURING TRAWL AND SEINE NET CAPTURE?

Wardle, C. S.
Scottish Fisheries Bulletin No. 38, pp. 14-18 (Dec. 1972). Her Majesty's Stationery Office at HMSO Press, Edinburgh, Scotland. Price not given.

The reaction of fish to the presence of fishing gear such as trawls or seines is important to capture techniques. In other reports of seine net operations divers observed how the fish are herded into the pathway of the net. The fish swim forward keeping station with the wings of the net until, during the fast haul, they turn around and swim back into the funnel of the net. At this stage some fish will turn again and swim with the net before finally falling back.

Experiments were performed to determine fish swimming speed and endurance relative to optimizing fishing gear techniques. In a sea-water tank, 30 feet in diameter, a group of cod, haddock, and saithe were induced to swim for 102 hours at 2 knots, a distance of 204 nautical miles. It was found that the fish will swim, for long periods of time, at any speed up to twice their own body length per second; for a fish 20 inches long the speed is 2 knots. However, when the fish were induced to swim at higher speeds their endurance was immediately limited. For a 20-inch fish, speeds between 7-10 knots could be induced, but the endurance was limited to less than 1,000 feet. Different muscle systems are used by fish for swimming at 2 knots or less and for swimming at higher speeds. Below 2 knots an aerobic energy utilization system is used. When the speed is increased the other muscle system is used which operates on anaerobic energy conversion with a limited fuel supply (glycogen). The replenishment of this system takes up to 24 hours.

(over)

2.12 (2.1471) DESIGN AND EVALUATION OF A SAMPLER FOR MEASURING THE NEAR-BOTTOM VERTICAL DISTRIBUTION OF PINK SHRIMP, PANDALUS JORDANI

Beardsley, Alan J. (Northwest Fisheries Center, National Marine Fisheries Service, NOAA, 2725 Montlake Blvd. East, Seattle, WA 98102)
Fishery Bulletin 71, No. 1, 243-253 (Jan. 1973)

A shrimp sampler was constructed as one portion of a research effort dealing with the development of a fish-shrimp separator trawl. The sampler segregated shrimp caught in a series of 1-ft high vertical openings positioned between the seabed and a height of 13 ft above the seabed. Knowledge of the vertical distribution of shrimp was considered essential in the design of an efficient shrimp trawl. Results indicated that vertical distributions of shrimp vary, and the amount of light striking the seabed is suggested as the triggering stimulus. Auxiliary investigations conducted with the sampler dealt with evaluations of mesh size and tickler chain. Experiments indicated that mesh sizes smaller than 2 inches restrict the passage of shrimp. The weight of shrimp caught was nearly doubled when a tickler chain was used. The sampler may have application to both shrimp biologists and commercial fishermen.
[8 figures, 5 tables, 11 references] Author's abstract

2.3 METHOD FOR REMOVING MEAT FROM THE SHELLS OF BIVALVE MOLLUSKS

Hanks, Fletcher (P.O. Box 70, Easton, Md.) (pat.)
U.S. Patent 3,722,035
Official Gazette of the U.S. Patent Office 908, No. 4, 801 (Mar. 27, 1973)

Clams, which had been heated sufficiently to partially open their shells and to effect withdrawal of one end of the adductor muscle from the shell, are dropped into a body of water. Compressed air is introduced at the lower portion of the body of water. The clam meats are separated from the shell; the meats rise toward the surface and the shells sink to the bottom. The meats and shells are removed by individual conveyors extending into the body of water. FTP

2.1473 MARINE HAULING APPARATUS

Whipple, William D., and Howard W. Gifford; assignors to Prelude Corp., Westport Point, Mass. (pat.)
U.S. Patent 3,722,126
Official Gazette of the U.S. Patent Office, 908, No. 4, 824 (Mar. 27, 1973)

The device is used aboard vessel to haul a trawl [longline ?] of marine life-harvesting equipment using a pulleylike unit. FTP

2.114 FISH NET RETRIEVAL APPARATUS

Hatley, Lowell J. (5452 - 40th Ave., West, Seattle, Wash.) (pat.)
U.S. Patent 3,707,799
Official Gazette of the U.S. Patent Office 906, No. 1, 113 (Jan. 2, 1973)

The apparatus has an endless belt running around two spaced-apart spools or drums. Power is applied to the drums and belt for reeling in the fishing net. FTP

2.3 METHOD AND APPARATUS FOR REMOVING WORMS AND PARASITES FROM THE FLESH OF FISH
(9.15)

Schmader, Joseph M. (Hunts Point Rd., Cape Elizabeth, ME 04107) (pat.)
U.S. Patent 3,720,981 (Mar. 20, 1973)

The apparatus is used to remove worms and parasites from the fillets of fish that may be infested with such materials. The fillets are held against a light source to render the worms or parasites visible. The objects are then removed by inserting a cannula in the infected area and withdrawing the worm or parasite by suction. FTP

2.3 WASTE WATER DRYER

Nakamura, Yoshinosuke (Tanaka Mach. Co., Ltd., Osaka, Japan)
Chemical Abstracts 78, No. 8, 45449e (Feb. 26, 1973)

2.3 METHOD OF FORMING A CONTINUOUS ADHERENT BATTER ON A FOODPIECE

Fischer, Leonard G., Monroe B. Sherain, Nancy A. Cornacchio, Bernard J. Ebtner, and Ferdinand E. Petrinato; assignors to DCA Food Industries Inc., New York, N.Y. (pat.)
U.S. Patent 3,723,137
Official Gazette of the U.S. Patent Office 908, No. 4, 1080 (Mar. 27, 1973)

This is a process for applying a dripless batter to a piece of food. FTP

2.1471 (2.1475)

Thus the endurance of the fish is limited at speeds above 2 knots and leaves the fish exhausted for a long time relative to the short period of the capture process. In practical terms, when the fish is made to swim at higher, exhausting speeds, it moves away from the device that is inducing it to swim and will seek an alternative route that will allow it to swim at less than 2 knots. The 20-inch cod swim 2,000 feet stationed in front of the footrope of the trawl at 4 knots, but then it will seek a new, slower route. In this case, it will turn and swim down the funnel of the net. A 3-foot cod is just large enough to swim for an unlimited period in front of the net and maintain a supply of fast swimming fuel. This size fish, and larger, may accumulate in front of trawls and swim away after the net is made ready to be brought to the surface. Operation of trawls and seines should be based upon this knowledge of fish behavior.
[1 figure, 1 table] SW

2.1113 ANTIFOULING PAINT FOR SHIPS' BOTTOMS AND UNDERWATER STRUCTURES

Fujimura, Hiroshi; Yoshio Nose, and Kanazawa Teiichi (Kumiai Chemical Industry Co., Ltd.) (pat.)
British Patent 1,296,814 (Nov. 22, 1972)
Chemical Abstracts 78, No. 8, 45185r (Feb. 26, 1973)

4.13 (8.53) PHOSPHOLIPIDS OF MARINE ORIGIN. VI. THE OCTOPUS (OCTOPUS VULGARIS)

De Konig, A. J. (Univ. of Botswana, Lesotho and Swaziland, Roma, Lesotho, Africa)
Journal of the Science of Food and Agriculture 23, No. 12, 1471-1475 (Dec. 1972)

This study of the phospholipids of the octopus was undertaken because little information is available on the particular subject. The composition of the phospholipids was determined by analysis of hydrolytic breakdown products and by chromatography on silicic acid. According to the author, the most remarkable feature of the phospholipids of the octopus was the high level of ceramide aminoethylphosphonic acid. Also, the octopus was a rich source of ciliatine, containing more than twice that in the abalone. Some pertinent data are given in the tables that follow.

Class of compounds	Composition of octopus phospholipids as % of total phospholipids (avg.)
Cardiolipins plus neutral lipids	3
Phosphatidylethanolamine	30
Phosphatidylserine	5
Ceramide aminoethylphosphonic acid	13
Phosphatidylinositol	4
Phosphatidylcholine	42
Sphingomyelin	3

(over)

6.190 A REVIEW OF THE CHEMICAL AND NUTRITIVE PROPERTIES OF CONDENSED FISH SOLUBLES

Soares, Joseph, Jr., David Miller, Susan Cuppett, and Paul Bauersfeld, Jr. (College Park Fishery Products Technology Laboratory, National Marine Fisheries Service, NOAA, College Park, MD 20740)
Fishery Bulletin 71, No. 1, 255-265 (Jan. 1973)

This paper is a review of some of the pertinent data available on the chemical and nutritive properties of condensed fish solubles with special reference to condensed menhaden solubles. Information concerning other kinds of fish solubles from various published sources is tabulated for comparison. The results of three analytical and three biological studies of menhaden solubles are reported.

Data show that menhaden stickwater contains an average of 4.8% protein, 93.4% water, and about 1.25% lipid. The solids are concentrated about seven times by vacuum evaporation to yield condensed solubles. Data show that this product contains about 32% protein, 49% water, and 11% fat. Additional data are presented on the content of amino acids in fish solubles, which show that the indispensable amino acid tryptophan is relatively low and, on the content of essential inorganic elements which are shown to be present, generally in acceptable levels. Fish solubles are shown to be rich sources of choline, niacin, pantothenic acid, riboflavin, biotin, and vitamin B_{12}.

An experiment with broiler chicks showed that the average metabolizable energy content of 10 samples of condensed menhaden solubles from commercial plants located along the Atlantic and Gulf coasts was 2.03 kcal/g on an "as fed" basis. Average protein and fat digestibility was 89 and 57%, respectively.

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4.13 (8.53) A NEW STEROIDAL SULFATE OBTAINED FROM A STARFISH SAPONIN, ASTEROSAPONIN A

Ikegami, Susumi, Yuji Kamiya, and Saburo Tamura (Dept. of Agricultural Chemistry, University of Tokyo, Bunkyo-ku, Tokyo, Japan)
Tetrahedron Letters No. 10, 731-734 (Mar. 1973)

In 1965, T. Yasumoto and Y. Hashimoto [Agr. Biol. Chem. 29, 804 (1965)] isolated a toxic saponin, asterosaponin A (I), from the starfish; it contains a steroidal aglycone to which two moles each of 6-deoxy-D-galactose and 6-deoxy-D-glucose and a mole of sulfuric acid are attached. Later, the present authors showed that I was a spawning inhibitor to the starfish and established the structure of its main aglycone as 3β,6α-dihydroxy-5α-pregn-9(11)-en-20-one.

In the present study, the authors isolated from I a novel steroidal sulfate and established its structure as 6α-hydroxy-3β-sulfo-oxy-5α-pregn-9(11)-en-20-one. [9 references]

FTP

6.31 NITROGEN METABOLISM OF AQUATIC ORGANISMS. II. THE ASSIMILATION OF NITRATE, NITRITE, AND AMMONIA BY BIDDULPHIA AURITA

Lui, Nan S. T., and Oswald A. Roels (Biological Oceanography, Lamont-Doherty Geological Observatory of Columbia University, Palisades, NY 10964)
Journal of Phycology 8, No. 3, 259-264 (1972)

Relatively little is known about the general principles of nitrogen assimilation in marine algae. Better knowledge of the nitrogen metabolism of marine phytoplankton would provide a basis for predicting the effects of nitrogen enrichment or depletion on phytoplankton stocks. By determining the preferential use of various forms of nitrogen by phytoplankton and of the nature and control of nitrogen uptake, assimilation, and cellular function, we will increase our understanding of the marine food chains. Diatoms are one of the most important groups of marine phytoplankton; the centric marine diatom B. aurita is widely distributed throughout the world's oceans. In this study, the authors examined the uptake and metabolism of nitrate, nitrite, and ammonia, the activities of nitrate- and nitrite-reducing enzymes, and the adaptation of these enzymes to different nutritional conditions.

B. aurita can use nitrate, nitrite, or ammonia as its sole source of nitrogen. The cells remove ammonium nitrogen from the medium 2.3 to 2.4 times as fast as they remove nitrate or nitrite nitrogen. When the cells are grown for 24 hr. in ammonium medium, they contain higher levels of nonprotein nitrogen than when they are grown in nitrate or nitrite medium for the same period of time.

(over)

4.5 STUDIES ON THE TOXICITY OF THE AUTOXIDIZED OILS.
II. THE EFFECTS OF AUTOXIDIZED OILS ON THE ENZYMIC ACTIVITIES

Yoshioka, Masako, Katsuhisa Suzuki, and Takashi Kaneda (Dept. of Food Chemistry, Faculty of Agriculture, Tohoku University, Tsutsumi-dori, Amemiya, Sendai, Japan)
Journal of the Japan Oil Chemists' Society 21, No. 12, 881-887 (1972) [In Japanese; abstract in English]

Studies were performed to determine the effects of autoxidized oil on enzyme activity in vitro relative to toxicity to mice. Safflower oil at various stages of autoxidation was incubated with the following enzymes: a lipase, pepsin, papain, or cytochrome c. The results indicated that enzymes incubated with the oil that was the most autoxidized had the least activity. Only pepsin was not affected. Reduction of enzyme activity correlated well with increased toxicity of the oil for mice.

The autoxidized oil was fractionated to isolate the agent that caused inhibition of enzyme activity. The fractions were (1) low molecular weight compounds, (2) free fatty acids, and (3) other monomeric and polymeric compounds. The fractions were incubated with the enzymes to determine effects on activities. The low molecular weight compounds fraction was found to be most inhibitory of enzyme activity and was most toxic to mice.
[6 figures, 14 tables, 19 references]

SW

6.31

The nitrogenous compounds in the nonprotein nitrogen fraction from cells grown in each of the three media contain the same level of soluble-free amino nitrogen, combined amino nitrogen, and ammonium nitrogen. B. aurita cells grown in nitrate medium have nitrate- and nitrite-reductase activity; those grown in nitrite medium have nitrite-reductase activity; and those grown in the ammonium medium lack both enzymes.
[3 figures, 4 tables, 23 references]

FTP

6.15 COMPOSITION AND NUTRITIVE VALUE OF FISH SOLUBLES

Buraczewska, Lucyna, Stanisław Buraczewski, Stefania Lubaszewska, Barbara Pastuszewska, and Teresa Zebrowska (Inst. Anim. Physiol. Nutr., Jabłonna/Warsaw, Poland)
Chemical Abstracts 77, No. 17, 112858g (Oct. 23, 1972)

4.13 (8.53)

Fatty acid	Fatty acid distribution as % of total fatty acid methyl esters [1]	
	Octopus phospholipids	Octopus nonphosphorylated lipids
14:0	2	6
16:0	24	23
16:1	--	4
17:0	1	1
16:2	1	1
18:0	10	15
18:1	4	23
18:2	--	1
20:1	4	3
20:4	7	3
22:1 (?)	2	--
20:5	18	7
22:4	1	--
22:5	2	1
22:6	23	9

[1] Values lower than one were omitted.
[1 figure, 3 tables, 9 references]

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6.190

Further studies with broiler chicks showed that significant unidentified growth factor responses could be obtained when 5% menhaden solubles was used in diets. A significant response was obtained even when the chicks were reared in a gnotobiotic environment. This indicates that the presence of bacteria is not necessary for solubles to produce a growth response in chicks.
[11 tables, 42 references]

Authors' abstract

6.10 USE OF PLANT EXTRACTS AS ANTIOXIDANTS IN THE PRODUCTION OF FISH MEAL

Witas, Tadeusz (Szczecin, Poland)
Chemical Abstracts 77, No. 25, 163119z (Dec. 18, 1972)

6.31 HARVEST AND REGROWTH OF TURTLE GRASS (THALASSIA TESTUDINUM) IN TAMPA BAY, FLORIDA

Taylor, John L., Carl H. Saloman, and Kenneth W. Prest, Jr. (Gulf Coastal Fisheries Center, National Marine Fisheries Service, NOAA, St. Petersburg Beach, FL 33706)
Fishery Bulletin 71, No. 1, 145-148 (Jan. 1973).

One of the environmental catastrophes to occur in the past 30 years is the destruction of vast beds of turtle grass through dredge-fill operations, other types of coastal engineering,and pollution in its many forms. The most recent development that may affect turtle grass is the possibility of its harvest for use as a food supplement for livestock. Earlier work has shown that turtle grass leaves contain about 13% protein, and that turtle grass in pellet form significantly increased the weight gain and feed utilization of experimental sheep over that of control animals when added to normal rations as a replacement for alfalfa at a level of about 10%. One of the many questions raised by the success of these feeding trials is whether or not beds of turtle grass can survive and regrow after harvest. This report presents results of a study in which leaves in an experimental plot of turtle grass were repeatedly cut, measured, and compared with those taken from a control area between August 1968 and November 1969.

A comparison of leaf growth and new leaf production in plots of cut and uncut turtle grass, Thalassia testudinum, indicated that plants suffered no damage when harvested twice during a 6-month growing season in Boca Ciega Bay (Tampa Bay), Fla. In deeper or warmer waters where the growing season is protracted, three or more cuttings per year may prove practical.

[2 figures, 24 references] [Authors' abstract and extract of the introduction]

6.32 (0.5) THE ANTIBACTERIAL SUBSTANCES OF THE MARINE ALGA STICHOCHRYSIS IMMOBILIS (CHRYSOPHYTA)

Berland, Brigitte R., Daniel J. Bonin, Alain L. Cornu, Serge Y. Maestrini, and Jean-Paul Marino (Station Marine d'Endoume, Marseilles 7e, France)
Journal of Phycology 8, No. 4, 383-392 (Dec. 1972)

Algae are the primary producers of organic matter in the sea. Although bacteria are mainly algae-dependent as to their food, the algae-bacteria environment is not ruled by a simple trophic relationship; antibiosis may play an important role in marine ecology. The purpose of this study was to examine the substances extracted from the culture media of marine algae, and to test the action of these substances on bacteria isolated mainly from the marine environment. The present article is a report of results obtained with the chrysophyte S. immobilis. An initial gross screening was carried out with various algae species to choose an classify the most convenient species from the point of view of their antibacterial activity. A routine antibiogram technique was used [Y. A. Chabbert, L'antibiogramme. Sensibilité et résistance des bactéries aux antibiotiques. Ed. de la Tourelle, St. Mandé, France, 257 pp.].

S. immobilis was the most inhibiting of the algal species screened, and it was used in the present tests.

Two substances with antibacterial activity were concentrated from the culture medium of S. immobilis before senescence occurred. They were purified by a Sephadex G-25 filtration followed by 2-dimensional thin-layer chromatography on Merck F-254 silica gel plates. One of the substances is a peptide of molecular weight

(over)

6.54 EFFECT OF DRYING AND DESOLVENTIZING ON THE FUNCTIONAL PROPERTIES OF FISH PROTEIN CONCENTRATE (FPC)

Dubrow, David L. (College Park Fishery Products Technology Laboratory, National Marine Fisheries Service, NOAA, College Park, MD 20740)
Fishery Bulletin 71, No. 1, 99-104 (Jan. 1973)

Experiments were performed to determine the effects of drying and steam desolventizing on the functional properties of fish protein concentrate (FPC). The FPC's were produced by a room temperature extraction of either red hake or menhaden with azeotropic isopropyl alcohol. FPC's thus produced contained about 36% soluble protein and, when dried at ambient temperature and pressure, showed very little loss in protein solubility. Drying the extracted wet solids at 40° to 50°, 60° to 70°, 90° to 100°, or 140° to 150°C for 30 or 120 min produced decreased protein solubility, i.e., 30.7% (40° to 50°C) to 12.5% (100° to 120°C). Emulsion stability of an FPC-water-oil system was satisfactory with all samples except those dried at 140° to 150°C.

Desolventizing dry solids or alcohol wet solids by steam stripping produced a dramatic loss in soluble protein and emulsion stability. There was also a significant darkening in color of the FPC's desolventized as wet solids as compared to FPC's desolventized as dry solids.

Low temperature extraction coupled with low temperature drying produced FPC with greater functional properties than that produced by high temperature drying. To retain this functionality, methods other than steaming appear to be necessary. [1 figure, 3 tables, 6 references] Author's abstract and part of the summary

6.55 RECYCLING ANIMAL WASTES.
PART 1: THE PROBLEMS OF DISPOSAL, AND REGULATORY ASPECTS OF RECYCLED MANURES

Blair, Robert (Nutrition Section, Agricultural Research Council Poultry Research Center, West Mains Road, Edinburgh EH9 3JS, Scotland), and David W. Knight (Staveley Bank, West End, Halifax HX2 7PN, England)
Feedstuffs 45, No. 10, 32, 34 (Mar. 5, 1973)

The merits of manure disposal by using it in feed of farm animals (poultry and cattle) are discussed. The most successful method of utilizing manure is to reduce its moisture content to 15% or lower and then to include the milled material into compounded feedingstuffs. Manure dried to a moisture content below 10% will store for a year or more. The authors state that if the drying is carried out properly most of the microorganisms of the original manure will be destroyed. Use of poultry manure or litter as a feedingstuff for animals is not permitted in the United States, in part because these materials could contain drugs and antibiotics or their metabolites. The composition of dried poultry and cattle feces is shown in the table that follows.

(over)

6.32 (0.5)

of 3400 and containing 11 different amino acids linked in a 30 amino-acid molecule. The authors were not able to assign a chemical group to the second substance but it had a molecular weight of 2600 and may be related to "humic acids." The growth of the most sensitive bacteria was completely inhibited by 20-fold, or higher, concentrations of substances from the filtrate of the algal culture. Fifty-four strains of test bacteria were used; they were of various origins, but were mostly isolated from algal cultures or obtained directly from the marine environment. [6 figures, 5 tables, 61 references]

FTP

6.37 POSSIBLE USE OF CHLORELLA IN ANIMAL HUSBANDRY

Tomme, M. F., and V. A. Alekseev (U.S.S.R.)
Chemical Abstracts 78, No. 1, 3109p (Jan. 8, 1973)

6.55

Item	Poultry battery manure (mean)	Cattle feces (mean)	Item	Poultry battery manure (mean)	Cattle feces (mean)
Moisture %	11.4	10	Ether extract %	1.76	--
N 6.25 %	28.7	16.6	Nitrogen-free extract %(?)	35.61	--
Urea %	0.0	1.06	Available carbohydrate %	6.7	--
Uric acid %	6.3	--	Total sugars %	--	28.76
True protein %	10.5	--	Ash %	26.5	7.64
Total amino acids %	8.6	4.26	Ca %	7.8	1.56
Alanine %	0.61	0.45	P %	2.2	0.75
Arginine %	0.38	0.14	Na %	0.42	0.36
Aspartic acid %	0.71	0.52	K %	1.37	0.72
Glutamic acid %	1.12	0.66	Cu p.p.m.	61	15.63
Glycine %	1.33	0.37	Fe %	0.2	0.08
Histidine %	0.23	0.09	Zn p.p.m.	325	111.7
Isoleucine %	0.36	0.21	Mg %	0.63	0.27
Leucine %	0.55	0.44	Mn p.p.m.	291	88.7
Lysine %	0.39	0.33	Br p.p.m.	16	--
Methionine %	0.12	0.06	Cl %	0.93	--
Cystine %	0.15	--	Fiber %	13.84	--
Phenylalanine %	0.35	0.06			
Tyrosine %	0.27	0.04			
Proline %	--	0.24			
Serine %	0.38	0.15			
Threonine %	0.35	0.21			
Valine %	0.46	0.29			

FTP

6.132 AZEOTROPIC REMOVAL OF WATER-HYDROCARBON ALCOHOL MIXTURES FROM PRESS FISH CAKE

Meade, Thomas L. (69 Kenyon Ave., Wakefield, RI 02879) (pat.)
U.S. Patent 3,712,822
Official Gazette of the U.S. Patent Office 906, No. 4, 1400 (Jan. 22, 1973)

Wet fish press cake is preserved by the addition of an alcohol to the cake. The alcohol and water are subsequently removed from the press cake by azeotropic extraction with a hydrocarbon. By this process, the wet fish cake can be stored for long periods of time; the alcohol and water can be removed whenever convenient to produce a dry fishmeal product.

FTP

6.1 MANUFACTURE OF MEAL AND OIL FROM OILY FISH

Lohne, Per, and Ane O. Utvik (pat.) (Stidoljе- og Sildemelindustriens)
South African Patent 71 00,209 (Sept. 29, 1972)
Chemical Abstracts 78, No. 1, 3006c (Jan. 8, 1973)

6.55 FOOD ADDITIVE COMPOSITION OF SQUALENE, OLEYL ALCOHOL AND OLEIC AND LINOLEIC ACID

Stephenson, John L. (9004 Orange Hunt Lane, Annandale, VA 22003), and Joseph V. Gaven, Jr. (pat.)
U.S. Patent 3,723,130
Official Gazette of the U.S. Patent Office 908, No. 4, 1079 (Mar. 27, 1973)

A composition consisting of squalene, oleyl alcohol, oleic acid, and linoleic acid is added to feeds to improve their acceptance to animals.

FTP

6.55 STIMULATING THE GROWTH OF POULTRY WITH COUMERMYCIN

Berger, Julius, and Wilbur Lewis Marusich (Hoffmann-La Roche, Inc.) (pat.)
U.S. Patent 3,662,063 (May 9, 1972)
Chemical Abstracts 77, No. 10, 66191j (Sept. 4, 1972)

6.55 RECYCLING ANIMAL WASTES.
PART 2: FEEDING RECYCLED WASTES TO POULTRY AND LIVESTOCK

Blair, Robert, and David W. Knight
Feedstuffs 45, No. 12, 31, 35-36, 55 (Mar. 19, 1973)

Part 1 dealing with the problems of disposal of animal wastes and the regulatory aspects was published in the March 5 issue of this journal [vol. 45, no. 10, pp. 32 and 34]. Part 2 is a discussion of tests in which dried manure was fed to poultry, pigs, sheep, and cattle.

Dried manure can be used successfully in poultry diets. Assuming that all the phosphorus was available, it was shown that dried poultry manure, because of its phosphorus, amino acid, and energy content, would by computer analysis be a selected ingredient until it reached a price of $26.00 per ton. The pig apparently utilizes manure to the same extent as poultry.

Dried poultry manure can be utilized more successfully as a feedstuff for ruminants than as a feedstuff for nonruminants. Dried poultry manure is more suitable for feeding purposes than dried cow manure or dried poultry litter because of its higher nitrogen and mineral content. In the United Kingdom, plants have been installed to dry poultry manure and, to a small extent, poultry litter. It is estimated that 3-7% of the poultry manure and 1-3% of the poultry litter available nationally in the United Kingdom are dried and used in animal feedingstuffs. Some data involving trials on the fattening of beef are shown in the table that follows.

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7.59 (9.19) DETERMINATION OF POLYCHLORINATED BIPHENYLS IN THE PRESENCE OF ORGANOCHLORINE PESTICIDES BY THIN-LAYER CHROMATOGRAPHY

Reinke, J., J. F. Uthe, and H. O'Brodovich (Dept. of the Environment, Fisheries Service, Freshwater Institute, Winnipeg, Ontario, Canada)
Environmental Letters 4, No. 3, 201-210 (1973) [Published by Marcel Dekker, Inc., 95 Madison Ave., New York, NY 10016]

Most of the thin-layer chromatographic methods used to separate polychlorinated biphenyls and organochlorine pesticides are only semiquantitative or confirmatory. In this paper, the authors describe a simple, quick, inexpensive and easily reproduced thin-layer chromatographic method for the separation and quantitation of the two groups of materials. The method utilizes an aluminum oxide plate developed in a triethylamine:hexane solvent, with the use of steam and ultraviolet treatment for visualization. The recoveries range from 90 to 100%.
[2 figures, 4 tables, 10 references] FTP

7.0 THE p-VALUE APPROACH TO QUANTITATIVE LIQUID-LIQUID EXTRACTION OF PESTICIDES AND HERBICIDES FROM WATER. 2. SELECTION OF WATER:SOLVENT RATIOS AND NUMBER OF EXTRACTIONS

Suffet, Irwin H. (Dept. of Chemistry, Environmental Studies Institute, Drexel University, Philadelphia, PA 19104)
Journal of Agricultural and Food Chemistry 21, No. 2, 288-294 (Mar.-Apr. 1973)

In the analysis of pesticide residues in water we are concerned with the reproducible minimum detectable level of a given analytical procedure. The goal is to recover 100% of a pesticide and its metabolites for quantitative analysis or identification. However, some of the compounds are lost during each step of the analytical procedure (extraction, concentration, cleanup). For more accurate results, these losses must be minimized.

The p-value concept was used earlier [M. Beroza, M. N. Inscoe, and M. C. Bowman, Residue Rev. 30, 1 (1969); I. H. Suffet, J. Agr. Food Chem., to be published in 1973] to determine the optimal pH and solvent to approach 100% recovery of pesticide. The p-value is "the fraction of the total solute that distributes itself in the nonpolar phase of an equivolume solvent pair"; therefore, it presents the partition coefficient on a fractional basis.

In the present study, the author developed equations from liquid-liquid extraction (LLE) theory for the number of extractions and water:solvent ratios for maximum recovery for typical p-values. By means of computer program analysis of the equations developed, it was shown that a pesticide which has a p-value of

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7.599 (7.42) GAS-LIQUID CHROMATOGRAPHY-MASS SPECTROMETRY OF ORGANOMERCURY COMPOUNDS

Baughman, G. L., M. H. Carter, N. L. Wolf, and R. G. Zepp (Southeast Environmental Research Laboratory, College Station Road, Athens, GA 30601)
Journal of Chromatography 76, No. 2, 471-476 (Feb. 28, 1973)

Gas-liquid Chromatography (GLC) is widely used for the determination of methylmercury in fish, and now there is some interest in its use for the detection and analysis of organomercury compounds in environmental samples. S. Nishi and Y. Horimoto [Bunseki Kagaku (Jap. Anal.), 20, 16 (1969)] stated that ionic methylmercury compounds decompose during GLC. The present workers, therefore, examined the GLC behavior of organomercury compounds using GLC-MS (mass spectrometry).

Apparently the ionic methylmercury compounds do undergo decomposition during GLC; the decomposing proportion appears to increase as the sample size decreases. With large samples (10^{-5} g.), methylmercury salts (CH_3HgX; X = Cl, Br, or I) elute with characteristic retention times, but when samples are smaller (10^{-8} g.) single elution peaks having the same retention time are obtained regardless of X. The more ionic methylmercury compounds (methylmercuric hydroxide and methylmercuric acetate) are not eluted even at higher concentrations although decomposition products do emerge.

Phenylmercury salts decompose to give diphenyl mercury (major product). Organomercurials, dimethylmercury and diphenyl mercury, are eluted with no evidence of decomposition.

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7.0

≥0.90 in an aqueous solvent system can be extracted from the aqueous phase with 95% recovery in ≤5 successive extractions of ≤50 ml. with a total volume of ≤500 ml. of solvent. The author successfully tested the equations with serial extraction of 2,4-D by separatory funnel and vortex stirring extraction procedures. He indicated that the contribution to the total error of initial LLE step was less than 20% for a four-step serial extraction.
[1 figure, 6 tables, 26 references] FTP

7.599 (7.42)

The authors indicate that reliable analyses for methylmercury salts may be achieved using GLC but only if specially treated columns are used to make the decomposition reactions reproducible. Inasmuch as phenylmercury salts decompose extensively, GLC is not a good method for their analyses.
[2 figures, 2 tables, 22 references] FTP

7.0 TWO-COMPARTMENT MODEL OF RADIONUCLIDE ACCUMULATION INTO MARINE ORGANISMS. I. ACCUMULATION FROM A MEDIUM OF CONSTANT ACTIVITY

Ruzic, I. (Cent. Mar. Res., Inst. "Rudjer Boskovic," Zagreb, Yugoslavia)
Chemical Abstracts 78, No. 1, 2155p (Jan. 8, 1973)

7.42 (7.8) QUANTITATIVE ANALYSIS OF MERCURY IN BIOLOGICAL SAMPLES. I. SIMULTANEOUS EXTRACTION OF MERCURY AND COPPER AS DITHIZONATES AND THEIR SEPARATION

Woldich, H., and W. Pfannhauser (Fresch.-Inst. Ernaehrungswirtsch., Vienna, Austria)
Chemical Abstracts 77, No. 13, 86701d (Sept. 25, 1972)

6.55

Item	Results of 7-month beef fattening diet trial			
	Ration A	Ration B	Ration C	Ration D
Dried poultry manure (%)	--	--	20	30
Price per ton ($)	74.40	76.80	69.60	67.80
Liveweight gain per day (lb.)	2.46	2.43	2.46	2.28
Feed conversion	5.85/1	5.94/1	5.83/1	6.08/1
Cost per lb. liveweight gain ($)	0.194	0.203	0.181	0.184

[3 figures, 2 tables, 54 references] FTP

6.54 DEVELOPMENT OF A PROCESS FOR PREPARING A FISH PROTEIN CONCENTRATE WITH FUNCTIONAL PROPERTIES

Hyder, Kamaluddin (Texas A and M Univ., College Station, Tex.)
Chemical Abstracts 78, No. 3, 14595v (Jan. 22, 1973)

7.590 [ON A SYSTEMATIC ANALYTICAL PROCEDURE BASING UPON THIN LAYER CHROMATOGRAPHY FOR THE IDENTIFICATION OF SLIGHTLY VOLATILE ORGANIC SUBSTANCES POSSESSING TOXICOLOGICAL OR TOXICOLOGICAL-ANALYTICAL RELEVANCE]
EIN SYSTEMATISCHER DÜNNSCHICHTCHROMATOGRAFISCHER UNTERSUCHUNGSGANG ZUR AUSMITTLUNG WENIG FLÜCHTIGER ORGANISCHER SUBSTANZEN VON TOXIKOLOGISCHER UND TOXIKOLOGISCH-ANALYTISCHER RELEVANZ

Ahrend, K.-F., and D. Tiess (Abteilung für Toxikologische Chemie am Institut für Gerichtliche Medizin des Bereiches Medizin der Universität Rostock)
Zentralblatt für Pharmazie, Pharmakotherapie und Laboratoriums-diagnostik 111, No. 9, 933-957 (1972) [In German; abstract in English]

A simple and universally applicable systematic analytical procedure based on thin-layer chromatography for the separation and identification of slightly volatile organic substances and extracts from biological materials is described. The chromatographic procedures involve the use of a general sorbent (Kieselgel G) and four different, but commonly used solvents. Control of chromatographic conditions is achieved by means of co-chromatography using system-specific standard mixtures of reference substances. Unknown substances are detected and assayed by the sequential application of certain spray reagents.
[31 references] FTP

7.599 AN EVALUATION OF THE ALKALI FLAME DETECTOR AND THE COULSON ELECTROLYTIC CONDUCTIVITY DETECTOR IN THE ANALYSIS OF N-NITROSAMINES IN FOODS

Palframan, J. F., J. MacNab, and N. T. Crosby (Laboratory of the Government Chemist, Cornwall House, Stamford St., London SE1 9NQ, England)
Journal of Chromatography 76, No. 2, 307-319 (Feb. 28, 1973)

This paper reports on the comparison of results obtained when using two different nitrogen detectors (the alkali flame ionization [thermionic] detector and the Coulson electrolytic conductivity detector) in conjunction with commercial gas chromatographs in the analysis of N-nitrosamines in foods. Only slight differences in sensitivities of the two detectors were observed; however, the Coulson electrolytic conductivity detector was more selective and was less disturbed by small changes in operating parameters. It is, thus, considered the more suitable for routine use in this field of analysis.
[10 figures, 2 tables, 44 references] FTP

9.15 (0.5)(9.16) EDWARDSIELLA TARDA, A NEW PATHOGEN OF CHANNEL CATFISH (ICTALURUS PUNCTATUS)

Meyer, F. P., and G. L. Bullock (Bureau of Sport Fisheries and Wildlife, Stuttgart, AR 72160)
Applied Microbiology 25, No. 1, 155-156 (Jan. 1973)

Most of the bacterial diseases of cultured catfish are caused by aeromonads, pseudomonads, or myxobacteria. A systemic disease of cultured catfish occurring in 1969 was found to have been caused by the enteric organism E. tarda. The source of the organism infecting the catfish was not identified; it may have been fecal contamination from human or other animals. Outbreaks of the disease have occurred annually since 1969 in catfish farms in the southern states area. So far, only the channel catfish have been affected.

In mild cases the disease produces small cutaneous lesions; as the disease progresses abscesses develop within the muscle of the flanks or caudal peduncle; and in advanced cases, the abscesses increase in size and develop as large cavities filled with a foul odorous gas.

The disease may be controlled by incorporating Terramycin (oxytetracycline) in the diet of the catfish at a rate of 2.5 g. per 100 lb. of fish per day for 10 days.

Although the disease does not cause catastrophic losses of catfish, it does have a severe economic impact on the commercial fish farms where it may occur. If the disease is not detected before harvesting the fish, the rate of infection will quickly increase when the fish are held in confienment prior to processing. If

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9.12 (1.25) MIGRATIONS OF THE SHAD

Leggett, William C.
Scientific American 228, No. 3, 92-98 (Mar. 1973)

The American shad (Alosa sapidissima) is the largest member of the herring family, attaining lengths of 40-50 cm. and weights of 1,400-2,200 g. The shad is anadromous: The eggs hatch in fresh water; the young remain a few months and then move out to the sea. The shad live in the sea until sexually mature, about 3 to 6 years, then return to spawn in the stream where they were hatched. The adults that survive the annual spawning run return to the sea. Shad originally moved up and down the Atlantic coast of North America and spawned in the eastern rivers of the United States. In 1871, shad were successfully stocked in the Sacramento River of California. By 1880 they ranged widely off the Pacific coast.

In 1965 studies were undertaken to determine the effects of a thermal discharge from a power plant on the shad population. The plant is located on the Connecticut River at Haddam Neck, 15 miles above the mouth of the river. In addition to population data, information on ocean migratory routes and migration to spawning rivers was generated by the study.

More than 32,000 adult shad were tagged and released during the study and over 5,000 were recaptured in the Connecticut River. About 100 shad were captured at various places along the Atlantic coast, ranging from North Carolina to New Brunswick, Canada. Data indicate that from 1966 to 1972 the date when the first shad of the season was captured in the Connecticut River varied by only 5 days--April 7

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9.15 (1.88) CERCARIA TENUANS, LARVAL TREMATODE PARASITE OF MYTILUS AND ITS SIGNIFICANCE IN MUSSEL CULTURE

Canzonier, Walter J. (Stazione Idrobiologica di Chioggia, Università di Padova, 300 15 Chioggia (VE) Italia)
Aquaculture 1, No. 3, 267-278 (Dec. 1972)

The parasite C. tenuans potentially could cause heavy losses to cultured stock if environmental factors and cultural procedures favor its development and dispersion. It is a minimal hazard at this time.

The trematode was found on about 4% of the mussel M. edulis imported into Italy from the Ria de Arosa on the northwest coast of Spain. The parasite was not found in a survey of native mussel populations in the Laguna Veneta (upper Adriatic coast of Italy). Infected mussels have an orange coloration that is characteristic of the disease, and the sporocysts (of the parasite) are visually motile, making recognition of the parasite possible with the unaided eye. Examination of infected mussel tissue indicated minimal pathology, with no obvious response to the presence of viable sporocysts. The authors suggest that at the low levels of the parasite reported it would not cause serious losses in natural and cultured mussel populations.
[2 figures, 1 table, 11 references] SW

9.12 (1.25)

to April 12. The movement of shad into the river continued until June. By capturing tagged shad, their marine movements were plotted and found to be related to water temperatures in the rivers and the sea. When the temperature was below 4° C. few shad entered the Connecticut River; above that temperature the number of shad increased until the water was about 13° C. Further up the river at Holyoke, Mass., the peak movement of fish over a hydroelectric dam fish lift took place at temperatures between 16.5° and 21.5° C. In the southern river, the St. Johns, the shad waited until the temperature declined to below 20° C. before entering from the sea. On the Pacific coast, the peak movement of shad over the Bonneville Dam ladders on the Columbia River occurs between 16.5° and 19° C. The hatching and survival of shad eggs and young are at a maximum when the water temperature is between 15.5° and 26.5° C. Shad entering the Connecticut River early in the season when temperatures were low had a higher return rate than shad entering at higher temperatures. It was further found that higher temperature rivers south of the Chesapeake (Bay) lacked repeat spawners, but this disadvantage was compensated by earlier maturity and greater fecundity.

Shad entering the Connecticut River to spawn avoid the plume of warm water from the generating plant by moving in the ship channel near the shore opposite the plant. [7 figures]

SW

9.16 SYMPOSIUM ON MOLLUSCAN AQUACULTURE

Shaw, William N. (convener) (Marine Extension, National Marine Fisheries Service, NOAA, Easton, Md.)
Bulletin of the American Malacological Union, Inc., Annual Report, 27 pp. (Feb. 1972). Price not given. (3957 Marlow Court, Seaford, NY 11783)

The papers presented at the symposium are listed below.
"The Role of Genetics in Molluscan Mariculture," by R. W. Menzel, p. 13;
"Recent Advances in Clam Aquaculture," by Hugh J. Porter, p. 16;
"Development of Closed System Oyster Culture," by Don Maurer, p. 18;
"Mariculture Experiments With the Bay Scallop, Argopecten irradians, in Waters of the Seaside of Virginia," by Michael Castagna and William P. Duggan, p. 21;
"Aquaculture of Mollusks in the Gulf Coast Region," by T. J. Costello, p. 22;
"Aquaculture of Mollusks Along the West Coast of the United States," by William N. Shaw, 23; and
"Molluscan Aquaculture in British Columbia," by Neil Bourne, p. 25.
Each article has a bibliography; over half the articles are illustrated. SW

7.773 THE REPRESENTATION OF LOWER MOLECULAR WEIGHT FATTY ACIDS BY THE BLIGH AND DYER EXTRACTION METHOD

Hurst, R. E. (Fisheries Research Board of Canada, Vancouver Laboratory, Vancouver 8, British Columbia, Canada)
Journal of the Fisheries Research Board of Canada 29, No. 12, 1786-1787 (Dec. 1972)

The presence of free fatty acids is used as an index of deterioration of fish tissue. The accumulation of long chain fatty acids is caused by hydrolysis of triglycerides; an increase in short chain fatty acids is attributed to autoxidation. The method of E. G. Bligh and W. J. Dyer [Can. J. Biochem. Physiol. 37, 911-917 (1959)] is capable of extracting over 90% of fatty acids with chain lengths of 14 or more carbons. In experiments performed to determine the relation of short chain fatty acids to the Bligh and Dyer method it was shown that low molecular weight fatty acids are not effectively recovered in the chloroform phase of the solvent system.
[1 figure, 10 references]

SW

9.15 (0.5)(9.16)

infected fish reach the processing line, it will be necessary to halt processing to permit removal of the infected fish and sterilization and deodorization of the equipment. Financial losses may be great even when only a small number of infected fish are involved.
[3 references]

FTP

9.15 PROGRESS IN FISH PATHOLOGY IN THIS CENTURY

Sniezko, S. F. (Eastern Fish Disease Laboratory, Leetown, Kearneysville, W. Va.)
Symp. Zool. Soc. Lond. 30, 1-15 (1972)
Aquatic Sciences & Fisheries Abstracts 3, No. 1, 30802G, p. 177 (Jan. 1973)

The premise that epidemics are caused by lack of balance between the host, the pathogen or other disease agents, and the environment is the basis for modern epidemiology. Aquatic coldblooded animals are affected more by the environment than are warmblooded land animals. Consequently, epidemics in fish are strongly affected by environmental factors. Diseases that show clearly the affects of environment were selected to highlight this review of the history of fish pathology.

SW

7.44 ROUTINE METHODS FOR THE EXAMINATION OF MEAT AND MEAT PRODUCTS. 10. THE DETERMINATION OF NITROGEN BY KJELDAHL. THE NITROGEN SUBSTANCE, INTERPRETATION AND POSSIBLE ERROR

Wyler, O. D.
Fleischwirtschaft 52, No. 9, 1088-1090 (1972) (In German)
Food R.A. Abstracts 26, No. 1, Abstract No. 12, 2 (Jan. 1973)

The method is discussed in relation to its application to meat and meat products and details of the method are given. C.S.B. Reprinted

9.16 REPORTS ON FISH CULTURE RESEARCH SUPPORTED BY ROCKEFELLER FOUNDATION

[Various authors and reports as listed below]
Joint Commission on Rural Reconstruction, Fisheries Series No. 12, Taipei, Taiwan, Republic of China (June 1972), 87 pp.

Card A

This series contain eight progress reports on fish culture research supported by the Rockefeller Foundation. These are as follows:
"Preliminary Report on the Mass Propagation of Grey Mullet, Mugil cephalus Linnaeus," by I-Chiu Liao, Ching-Shan Cheng, Lei-chiang Tseng, Mee-yoon Lim, Lungsheng Hsieh, and Husei-pin Chen, pp. 1-14. [In English]
This paper summarizes the work carried out on the mass production of grey mullet fingerlings over a 2-year period starting in 1970. [4 figures, 3 tables, 5 references]
" A Survey of the Chemical Properties of Bottom Soils of Freshwater Fish Ponds in Taiwan," by W. Chiang, C. Y. Jaw, A. L. Hsieh, and H. S. Shyu, pp. 15-34. [In Chinese; English summary]
This paper describes the physical characteristics and gives the chemical composition of the bottom soils of selected fresh-water fishponds in Taiwan. The texture of the soil fell into eight classes: clay, silty clay, silty loam, silty clay loam, clay loam, sandy loam, sandy clay loam, and loam. The pH ranged from 5 to 7.5; organic content from 0.65% to 10.0%; total nitrogen content from 0.09% to 0.70%; and inorganic phosphorus ranged from 141.9 to 2,531 p.p.m. The concentration of calcium "phosphorus," iron "phosphorus," aluminum "phosphorus," and

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9.16 STUDIES ON THE NUTRITION OF MARINE FLATFISH. THE EFFECT OF ORAL ADMINISTRATION OF DIETHYLSTILBOESTROL AND CYPROHEPTADINE ON THE GROWTH OF PLEURONECTES PLATESSA

Cowey, C. B. (Natural Environment Research Council, Institute of Marine Biochemistry, Aberdeen, Scotland), J. A. Pope, J. W. Adron, and A. Blair
Marine Biology 19, No. 1, 1-6 (Mar. 1973)

The purpose of this study was to determine the effect of oral administration of different levels of diethylstilboestrol (DES) and cyproheptadine (CH) on body weight gain of plaice. DES was added to the test diet at levels of 600, 1,200, and 2,400 µg./kg. of the moist diet (53% water; 45% protein); the CH was added at levels of 50,000, 100,000, and 200,000 µg./kg. of the moist diet. The plaice were held in tanks at water temperature of 15° C. and were fed three times daily during a 12-hr. photoperiod. The test lasted 10 weeks.
Low-level orally administered DES (at 600 µg./kg. of the moist diet) gave rise to increased weight gain, food consumption, and food conversions of the fish. Higher dietary levels of DES were without effect on these parameters. The CH did not stimulate appetite, weight gain, or food conversion of the plaice at any of the levels tested.
[2 figures, 7 tables, 21 references] FTP

9.16 REPORTS OF FISH CULTURE RESEARCH SUPPORTED BY ROCKEFELLER FOUNDATION

[Various authors and reports as listed below]
Joint Commission on Rural Reconstruction, Fisheries Series No. 12, Taipei, Taiwan, Republic of China (June 1972), 87 pp.

Card B
Descriptions, photographs, and drawings are given for various species of protozoa, trematoda, and parasitic copepods infecting pond fishes of Taiwan. The organisms were collected from Sept. 1971 to Mar. 1972 and represent only a limited collection. [13 figures, 21 references]
"Experiments on Artificial Propagation of the White-Spotted Freshwater Catfish, Clarias fuscus (Lacépède)," by Ting-lang Huang and Huei-pin Chen (Tainan Fish Culture Station, Taiwan Fisheries Research Institute), and Chin-pao Hung (Tungkang Marine Laboratory, Taiwan Fisheries Research Institute), pp. 66-70. [In Chinese; abstract in English]
Two fresh-water catfish spawners that received fresh pituitary gland of common carp plus Synahorin achieved 100% ovulation, 90% fertilization, and 95% hatching rate. Those that received vacuum dried pituitary extract from common carp plus Synahorin achieved 60% ovulation, 60% fertilization, and 85% hatching rate. [8 figures, 1 table]
"Induced Spawning of the Catfish, Parasilurus asotus (Linnaeus)," by Gin-fu Chen, pp. 71-83. [In Chinese; English summary]

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9.16 PACIFIC SALMON AQUACULTURE PROGRAM. INCUBATION AND CULTIVATION PHASES

Lindbergh, Jon M.
Sea Grant Final Report, 52+2+1+3 pp. (n.d.) Ocean Systems, Inc., and Domsea Farms, Inc., 11440 Isaac Newton Square North, Reston, VA 22091.

The purpose of the program was to examine the feasibility of raising marketable-sized salmon on a commercial scale in Puget Sound, Washington. The report describes the six phases of the program: (1) Incubation of the salmon eggs, (2) Cultivation of fingerling salmon in fresh-water ponds, (3) Cultivation of salmon to a marketable size in floating pens in sea water, (4) Harvesting and test marketing, (5) Stimulation of public awareness of the acquaculture potential in the Puget Sound area, and (6) Environmental monitoring of waste materials associated with the project.
About 211,000 coho salmon were raised from eggs to an average marketable size (12 in., about 340 g.) in 14 months using floating net pens. Growth rates and conversion rates of the coho salmon were good; the fish were healthy. Market acceptance was good. The report states that salmon aquaculture appears to be ready for commercial development although there are substantial risks. Significant problems remaining to be solved are: (1) Adequate inventory control of fish was not achieved; (2) Chinook salmon did not do well and appears not to be suitable for aquaculture at the present state of the art; (3) Significant numbers of one group of coho transferred to sea water in August did not begin to grow until spring, and

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Treatment of the catfish with a mixture of pituitary hormone and tannic acid was found to be the most satisfactory among several treatments used to induce spawning of the fish. [5 figures, 4 tables, 9 references]

"Preparation of Sex Stimulating Hormone From Pituitary Glands of Common Carp," by Hon-der Lin, pp. 84-87. [In Chinese; abstract in English]

In the artificial propagation of fish, hormone (pituitary) treatment is used to stimulate maturation and ovulation. This paper describes the extraction of the hormone from the pituitary gland of the common carp. [3 tables, 3 references]

FTP

Hayama, Kazuhiko, and Shizunori Ikeda (Fac. Agric., Kyoto Univ., Kyoto, Japan)
Chemical Abstracts 77, No. 17, 112815r (Oct. 23, 1972)

9.14 METABOLIC CHANGES IN FISH CAUSED BY DIET VARIATION. I. EFFECTS OF DIET COMPOSITION ON THE METABOLIC CHANGES IN CARP

9.16

soluble phosphorus was 70.3%, 22.8%, 6.6%, and 0.23%, respectively, of the total inorganic phosphorus. The sodium level ranged from 0.01% to 0.04%; potassium, from 0.01% to 0.05%; calcium, from 0.03% to 0.6%; and magnesium, from 0.01 to 0.11%. [11 figures, 1 table, 17 references]

"Ecological Study of Milkfish Wintering Pond," by Hon-cheng Chen and Chi-yang Liu, pp. 35-49. [In Chinese; abstract in English]

The late season fingerlings of milkfish Chanos chanos must be stocked in wintering ponds in order that they may survive the winter; the overwinter mortality runs about 14%. This paper reports on the physical, chemical, and biological aspects of these wintering ponds. The two main factors causing fish kills are low-water temperature and oxygen deficiency. [19 figures, 1 table, 10 references]

"Studies on the Control of Brown Water in Milkfish (Chanos chanos) Ponds," by Shih-lin Shen and Young-meng Chiang, pp. 50-53. [In Chinese; abstract in English]

A bloom of Olisthodicus carterae caused the formation of brown water in the pond used to rear milkfish. The O. carterae grew in a wide range of salinity but was suppressed at salinities from 3.55 ‰ to 8.87 ‰. $CuSO_4$ and bleaching powder [hypochlorite ?] arrested growth of the organism but CaO did not. [5 tables, 6 references]

"Some Parasites Found in Pond Fishes of Taiwan," by Yen-pin Li and Shiu-nan Chen, pp. 54-65.

[Continued on Card B]

9.16

it appears that the coho salmon must be transferred early in summer; (4) More adequate sea-water facilities must be designed to improve maintenance and logistics characteristics; (5) Further research is needed on adequate foods for the fish; and (6) Genetic selection of suitable strains of coho salmon may be desirable over the use of fish spawned from wild parents.

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Other reports indicated many outbreaks of diseases associated with Vibrio sp. In aquaculture operations, reports from Japanese workers indicated that Vibrio sp. represent a major problem. Information implicating V. parahaemolyticus in fish disease is sparse. In pond-cultivated brown shrimp, corryneform and Vibrio sp. of bacteria predominate. Mortalities among brown shrimp caused by V. parahaemolyticus have been observed in the laboratory. However, there is no indication that the microorganism is a major problem in pond-cultivated shrimp in Texas.

[1 figure, 5 tables, 28 references] SW

9.16 VIBRIO PARAHAEMOLYTICUS: A PROBLEM IN MARICULTURE? (1.85)

Vanderzant, C., and R. Nickelson
Journal of MilK and Food Technology 46, No. 3, 135-139 (Mar. 1973)

9.17 A BIBLIOGRAPHY OF ARTIFICIAL REEFS AND OTHER MAN-MADE FISH ATTRACTANTS WITH SELECTED PERTINENT BIOLOGICAL AND ECOLOGICAL REFERENCES

Rickards, William L. (Sea Grant Program, School of Public Health, University of North Carolina, Chapel Hill, NC 27514)
Sea Grant Publication UNC-SG-73-04, 22 pp. (Mar. 1973). Sea Grant Program, School of Public Health, University of North Carolina, Chapel Hill, NC 27514.

This bibliography contains literature citations on man-made fish attractants. Such attractants may be floating or off-bottom structures and artificial reefs. The bibliography includes a section dealing with selected biological and ecological literature relative to the construction, maintenance, and evaluation of man-made fish attractants. [285 citations]

FTP

Hagenmaier, H. E. (Zool. Inst., Tech. Hochsch. Aachen, Aachen, Germany)
Chemical Abstracts 77, No. 25, 162132p (Dec. 18, 1972)

9.1 HATCHING PROCESS IN FISH. II. PURIFICATION AND CHARACTERIZATION OF HATCHING SECRETION IN RAINBOW TROUT (SALMO GAIRDNERI)

9.19 DDE: INTERFERENCE WITH EXTRA-RENAL SALT EXCRETION IN THE MALLARD

Friend, M., M. A. Haegele, and R. Wilson (U.S. Bureau of Sport Fisheries and Wildlife, Denver Wildlife Research Center, Denver, CO 80225)
Bulletin of Environmental Contamination and Toxicology 9, No. 1, 49-53 (Jan. 1973)

Of the shore birds showing population declines caused by pollution, all have in common a functional salt gland. The salt gland is the main route of sodium chloride excretion of birds living in a marine environment. As excess salt is ingested in their natural foods in habitats of high salinity, suppression of the salt gland function could be detrimental.

In other reports, DDT and its metabolites (such as DDE) were found to disrupt osmoregulatory function in marine fish.

A preliminary study was conducted to determine the effects of DDE (dichlorodiphenyldichloroethylene) on salt gland function in the mallard (Anas platyrhynchos). Groups of 5-month-old mallards were maintained on either fresh water or 1% salt water for 5 days before feeding with DDE supplements of 0, 10, 100, or 1,000 p.p.m. to commercial game bird pellet rations. The ducks from each group were injected with concentrated salt solutions: 12 ml. of a 10% solution intraperitoneally and 3 ml. of a 5% solution intravenously. Discharges from the salt gland were collected at 15-min. intervals for 2½ hr.

The results of the tests indicate that the composition of the salt excretions were unchanged. In addition, ducks fed 1% salt solution with their feed before receiving injections of concentrated salt solutions excreted about twice as much

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9.19 PCB RESIDUES IN ATLANTIC ZOOPLANKTON

Risebrough, R. W., and Valerie Vreeland
Bulletin of Environmental Contamination and Toxicology 8, No. 6, 345-355 (Dec. 1972)

Transport of pesticides by the wind is a major route of entry of these compounds to the marine environment. Although a large proportion of polychlorinated biphenyls (PCBs) are not released to the environment, they were detectable in all samples of rainwater in Great Britain, and they were found in fish taken from remote Arctic lakes.

To determine the presence of PCBs at the beginning of the food chain, samples of zooplankton from the Northwest Atlantic shelf and the open North and South Atlantic areas were taken for testing. The samples were ground and extracted with a 2:1 mixture of hexane and acetone. After clean-up procedures the extracts were subjected to gas chromatography analysis which confirmed the presence of PCBs by matching peaks of Aroclor 1254.

Results of the survey indicated that PCBs in zooplankton from the continental shelf and slope ranged from 0.071 to 3.0 p.p.m. dry weight. In the open North Atlantic the PCB content of zooplankton ranged from 0.30 to 0.45 p.p.m. wet weight. In the open South Atlantic the range was from 0.018 to 0.64 p.p.m. wet weight. The authors caution that the amount of PCBs found in the zooplankton might not reflect the overall PCB composition in the marine environment.
[1 table, 23 references] SW

9.19 (6.54) MERCURY REMOVAL FROM FISH PROTEIN CONCENTRATE

Regier, L. W. (Fisheries Research Board of Canada Halifax Laboratory, Halifax, Nova Scotia, Canada)
Journal of the Fisheries Research Board of Canada 29, No. 12, 1777-1779 (Dec. 1972)

The processing required in the production of fish protein concentrate (FPC) may present the possibilities of removing or reducing contaminants, such as mercury and mercury-containing compounds. Experiments were performed to determine whether mercury could be removed from FPC made by the isopropanol (IPA) extraction method [H. E. Power, J. Fish. Res. Bd Canada 19, 1039-1045 (1962)].

Commercially caught swordfish, that had been diverted from the market because of high mercury levels, was selected for processing into FPC by the IPA method. Before processing, the fish was thawed, chopped, and deboned. After the processing was complete, samples of the unprocessed deboned meat, the filter cakes after each of three extractions, and the finished product were analyzed for mercury. The unprocessed sample contained 1.01 p.p.m. mercury (wet basis); the finished FPC contained 5.69 p.p.m. mercury (wet basis). The results indicated that the unmodified process did not remove the mercury.

The finished FPC was reextracted with either isopropanol or ethanol acidified with various concentrations of hydrochloric acid. Isopropanol (99%) with a concentration of 0.55% HCl did not remove any mercury; isopropanol containing 4.43% HCl removed 86% of the mercury. A concentration of 70% isopropanol containing

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9.19 THE EFFECT OF PARATHION ON CRUSTACEAN SKELETAL MUSCLE-- II. DISRUPTION OF EXCITATION-CONTRACTION COUPLING

Bradbury, S. J. (Dept. of Biological Sciences, University of Lancaster, Bailrigg, Lancaster, England)
Comparative Biochemistry and Physiology 44, No. 4A, 1033-1046 (April 1, 1973)

Earlier work has shown that sublethal doses of parathion have important side effects which are not related to its anticholinesterase action. S. J. Bradbury [Comp. Biochem. Physiol. 44A, 1021-1032 (1973)] mentioned the induction by parathion of tonic contractures in the skeletal muscle of crab. The drug must in some way activate the excitation-contraction coupling mechanism of the muscle fibers. The present study was carried out to locate the action of the insecticide. In all the experiments, the contracture-induction effect was examined in terms of disruption of the electromechanical coupling process at the stages of membrane depolarization, the reticular calcium control system, actomyosin cross bridge formation, and structural changes in the fibers.

Apparently parathion action in the excitation-contraction coupling cycle is subcellular. It significantly depresses reticular calcium uptake. Also, the drug greatly modifies actomyosin superprecipitation and disrupts the reticular fine structure, suggesting a massive calcium loss from the reticulum into the myoplasm.
[10 figures, 1 table, 30 references] FTP

9.19 (6.54)

2.61% HCl removed 57% of the mercury. Ethanol (95%) containing 0.28, 0.5, and 1.09% HCl did not remove any mercury from the FPC; however, 95% ethanol containing 2.61% HCl removed 74% of the mercury in FPC.

The author suggests that nearly all mercury can be removed from swordfish FPC under conditions which should not destroy the nutrient value of the protein. However, a solvent system should be used that does not introduce questions regarding toxicity. [3 tables, 4 references]

SW

9.19 TRACE ELEMENT CONTENT OF SOME FISH SPECIES OF THE ADRIATIC COASTS, IN RELATION TO THE PRESENCE OF INDUSTRIAL WASTES

Ciusa, Walter, and Mario Giaccio (Ist. Merceol. Univ. Bologna, Pescara, Italy)
Chemical Abstracts 78, No. 1, 2897g (Jan. 8, 1973)

9.19 POLYCHLORINATED BIPHENYL- AND TRIPHENYL-INDUCED GASTRIC MUCOSAL HYPERPLASIA IN PRIMATES

Allen, J. R., and D. H. Norback (Dept. of Pathology, Medical School, and Regional Primate Research Center, University of Wisconsin, Madison, WI 53706)
Science 179, No. 4072, 498-499 (Feb. 2, 1973)

Male rhesus monkeys were fed diets containing polychlorinated biphenyl or polychlorinated triphenyl for 3 months. Six monkeys were fed a diet containing 300 p.p.m. of PCB (Arochlor 1248); six were fed a diet containing 5,000 p.p.m. of PCT (Aroclor 5460); and three served as controls. Those animals fed a diet containing the test chemicals continued to eat throughout the experimental period, but they lost 15% of their body weight and showed various other symptoms. Ingestion of the polychlorinated biphenyl or polychlorinated triphenyl produced hyperplasia [increase in the number of tissue elements, excluding tumor formation] and dysplasia [abnormal tissue development] of the gastric mucosa. It is interesting to note that the concentration of the polychlorinated biphenyl in the diet was less than one order of magnitude greater than that occurring in random food samples sold in the market and less than levels that have occurred in food products as a result of industrial accidents. The authors believe that the dysplastic cellular abnormalities of the hypertrophic gastric mucosa are likely due to chronic irritation but at present are short of neoplastic transformation. Furthermore, they indicate that development of hypertrophy, hyperplasia, and dysplasia of the gastric mucosa of subhuman primates requires clarification of the carcinogenic potentials of these compounds.
[2 figures, 12 references]

FTP

9.19

sodium chloride as the ducks maintained on fresh water before the injection of the concentrated salt solutions. Furthermore, the salt glands of ducks previously stimulated with low-level salt were twice as large as those in ducks maintained on fresh water.

The authors concluded that DDE has no effect on excretion of salt from salt glands of mallards previously stimulated by low-level salt exposure. On the other hand, DDE can suppress salt gland excretion of salt in mallards not previously exposed to salt. The implications of the effects of DDE exposure on shore birds, juveniles or adults, not previously exposed to salt are that they would be unable to eliminate toxic levels of salt taken in while feeding.
[3 figures, 2 tables, 8 references]

SW

9.19 EFFECTS OF AGRICULTURAL CHEMICALS ON FISH. I. CHANGES OF CHEMICAL COMPONENTS IN THE SERUM AND LIVER OF CARP EXPOSED TO ORGANOPHOSPHATE COMPOUNDS

Sakaguchi, Hiromi (Fish. Exp. Stn. Hyogo, Akashi, Japan)
Chemical Abstracts 77, No. 25, 160802f (Dec. 18, 1972)

9.19 ECOLOGICAL SIGNIFICANCE OF THE DISCHARGE OF TREATED WASTEWATERS INTO COASTAL WATERS

Hlavka, George E. (Southern California Coastal Water Research Project, 1100 Glendon Ave., Los Angeles, CA 90024)
Journal of Milk and Food Technology 36, No. 1, 23-27 (Jan. 1973)

Research work is being carried out under the Southern California Coastal Water Research Project to obtain an understanding of the ecology of the coastal waters of Southern California. The study is expected to provide an insight into the past, present, and predicted effects of man on the ecology of the area, particularly those effects caused by wastewater discharges. The results will be needed in any effort to limit harmful effects on the environment and to promote its enhancement. The work so far dealt with 17 task areas of physical and chemical oceanography, marine biology, and environmental engineering. This paper is a discussion of some of the technical problems associated with the study (quantifying the natural fluctuations of physical, chemical, and biological parameters, establishing environmental criteria, and correlating observed effects with pollutant distributions).
[1 figure, 1 table, 1 reference]

FTP

9.19 ENVIRONMENTAL ASPECTS OF NUCLEAR POWER STATIONS

Bethlendy, George (974 Vera Cruze Drive, Mississauga, Ontario, Canada)
Environmental Letters 4, No. 3, 151-185 (1973) [Published by Marcel Dekker, Inc., 95 Madison Ave., New York, NY 10016]

This is the first part of a monograph by the author. The monograph consists of an introduction and nine chapters, and it will be published in serial form in this and following consecutive editions of this journal.

Our exposure to the radioactivity from nuclear power sources is minute compared to that from nature and from diagnostic and therapeutic X-rays. The world's need for energy will quadruple in the next 30 years and it appears that a growing share of the total will be provided by nuclear energy. The growth in nuclear power production will increase the amount of radioactive wastes that must be managed to avoid environmental pollution. This could be done, because the technology of nuclear waste management is well developed.

Nuclear energy will eventually diminish pollution as it replaces other sources of electrical power such as coal and oil. Nevertheless, particular attention is being given to problems such as the thermal effects of nuclear power plants, the improvement of the technology and economics of containment techniques for reactors and radioactive waste, decommissioning of old nuclear power plants, and the behavior of radioactive materials in water and aquatic organisms.
[8 figures, 5 tables, 4 references]

FTP

9.19 (0.6) REDUCTION OF MERCURY WITH CYSTEINE IN COMMINUTED HALIBUT AND HAKE FISH PROTEIN CONCENTRATE

Spinelli, John, Maynard A. Steinberg, Ruth Miller, Alice Hall, and Lawrence Lehman (U.S. Dept. of Commerce, NOAA, National Marine Fisheries Service, Pacific Fishery Products Technology Center, Seattle, WA 98112)
Journal of Agricultural and Food Chemistry 21, No. 2, 264-268 (Mar.-Apr. 1973)

In some areas, certain fish are routinely analyzed for mercury content to see that they do not exceed the established level of 0.5 p.p.m. Fish containing more than this level of mercury are not marketed and may represent a serious economic loss to the fishing industry. These losses might possibly be reduced, if some means could be devised to remove some of the mercury from the fish flesh. With this economic loss in mind, the researchers carried out tests to determine the effectiveness of the use of cysteine in reducing the mercury content of comminuted fish flesh and of fish protein concentrate. Sulfhydryl compounds (containing the mercapto group -SH) react with mercury and certain of them (for example, 2,3-dimercapto-1-propanol) have been used as detoxicants in cases of mercury poisoning. The amino-acid cysteine is a naturally occurring sulfhydryl-containing compound.

Communited fish (hake) flesh was extracted with 0.1 M NaCl containing cysteine $HCl \cdot H_2O$ at levels of 0.1%, 0.2%, and 0.5%. The orginal level of mercury in the fish flesh ranged from 1.06 to 1.20 p.p.m., wet weight of fish. The amount of mercury extracted from the comminuted fish varied with the concentration in the tissue and pH; the relationship was not linear. When the comminuted fish was extracted with 0.1 M NaCl containing 0.1% cysteine, about 22% of the mercury was

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9.19 THE EFFECT OF INCREASED TEMPERATURE UPON THE ACUTE TOXICITY OF SOME HEAVY METAL IONS

Rehwoldt, Robert, Lawrence W. Menapace, Brian Nerrie, and Denise Alessandrello (Environmental Science Program, Marist College, Poughkeepsie, N.Y.)
Bulletin of Environmental Contamination and Toxicology 8, No. 2, 91-94 (Aug. 1972)

Thermal discharges into a body of water raise the temperature of the water, increase the metabolism of aquatic life, and decrease the solubility of oxygen. In addition, substances that control water quality are affected such as increases in solubility and diffusion rates. The toxicity of water-soluble toxic substances is related not only to temperature but also to water qualities such as hardness and mechanism of producing toxicosis. For example, if the mechanism for producing toxicosis involved an intercellular, biochemical reaction, an increase in water temperature predictably would increase toxicity. In contrast, if the toxic mechanism involved the deposition of a gelatinous metal hydroxide on the gill membranes of a fish, hardness of the water would be the factor affecting toxicity rather than temperature.

The toxicity of six metal ions was investigated at water temperatures of 28° C. and 15° C. The temperature of 28° C. was selected because it is the same as the ambient temperature of the thermal plume of a power station on the Hudson River at the town of Newburgh, N.Y. The mean toxicity limit for 50% survival of six representative Hudson River fish species relative to the ions and temperatures was established. The fish species were banded killifish, striped bass, pumpkinseed, white perch, American eel, and carp. The toxicity of the following ions was tested: Cu^{++}, Zn^{++}, Ni^{++}, Cd^{++}, Hg^{++}, and Cr^{++}.

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9.19 THE INFLUENCE OF TEMPERATURE AND SALINITY ON THE TOXICITY OF CADMIUM TO THE FIDDLER CRAB, UCA PUGILATOR

O'Hara, James (Belle W. Baruch Coastal Research Institute, University of South Carolina, Columbia, SC 29208)
Fishery Bulletin 71, No. 1, 149-153 (Jan. 1973)

The waste discharge of electroplating plants, lead and zinc mines, and chemical plants frequently contains toxic cadmium salts which contribute to the widespread environment pollution, and the importance of this pollutant has been stressed by its relationship with the crippling "itai-itai" disease of Japan. The effects of cadmium on aquatic organisms have been investigated for numerous freshwater organisms, and while the cadmium is normally flushed down to the estuarine and marine environments, little information is available on the effects of cadmium on estuarine forms.

The present paper reports on the effects of chronic exposure of fiddler crab to cadmium. The synergistic role of salinity and thermal stress on the acute toxicity of cadmium to the crabs was examined.

The concentrations of cadmium lethal to the fiddler crab, were determined for various environmental regimes of temperature and salinity. Mortality was greatest in high temperatures and low salinities when tested for 240 hr. Concentrations of cadmium were greatest in green gland followed by gill, hepatopancreas, and muscle.

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9.19

The results of the tests indicated that toxicity of the ions was the same at either temperature except for Hg^{++}; the mean toxicity limit for 50% survival at 15° C. ranged from 0.37-0.74 p.p.m., while at 28° C. it ranged from 0.08-0.42 p.p.m. The authors concluded that the toxicity of mercury increases as the temperature increases.
[4 tables, 9 references] SW

9.19

Earlier workers suggested that there is a threshold concentration of cadmium in the gill tissue of fishes and that death occurs when this concentration is exceeded. This threshold may be around 110 ppm for fiddler crabs.

The relationship between cadmium toxicity and temperature and salinity variation illustrates that physiological stresses, even within the usual ecological range experienced by the animals, lowers the tolerance of organisms to environmental pollutants.
[2 figures, 1 table, 13 references] Extracted with slight modification

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9.19 BIOCHEMISTRY OF SELECTIVE TOXICITY AND BIODEGRADABILITY. (0.39) COMPARATIVE O-DEALKYLATION BY AQUATIC ORGANISMS

Hansen, Larry G., Inder P. Kapoor, and Robert L. Metcalf (Dep. Entomol., Univ. Illinois, Urbana, Ill.)
Chemical Abstracts 78, No. 1, 869a (Jan. 8, 1973)

9.19 BIOLOGICAL EFFECTS AND PHYSICAL PROPERTIES IN THE MARINE ENVIRONMENT OF ALIPHATIC CHLORINATED BYPRODUCTS FROM VINYL CHLORIDE PRODUCTION

Jernelov, Arne, Rutger Rosenberg, and Soren Jensen (Swed. Water Air Pollut. Res. Lab., Goteborg, Sweden)
Chemical Abstracts 78, No. 1, 849u (Jan. 8, 1973)

9.19 (0.6)

removed by the third extraction. When the extractant contained 0.2% cysteine, about 40% of the mercury was removed by the third extraction. When the extractant contained 0.5% cysteine, about 40% of the mercury was removed in the first extraction, and only an additional total of 10% was removed in the succeeding two extractions. When the comminuted fish was extracted with 0.1 M HCl there appeared to be an increase in mercury content. This seemed to indicate that the mercury in the fish flesh is associated with the myofibrillar or other insoluble proteins and not with the soluble sarcoplasmic proteins that were removed by the 0.1 M NaCl.

When cysteine was added to the isopropyl alcohol used in the first extraction of fish to prepare fish protein concentrate, the mercury level of the FPC was reduced by 50%.
[5 figures, 6 tables, 17 references] FTP

9.19 SEWAGE DAMAGE TO FISH

Koerting, W. (Zool-Parasitol. Inst., Univ. Muenchen, Munich, Germany)
Chemical Abstracts 77, No. 25, 160692v (Dec. 18, 1972)

9.19 (9.2) ECONOMICS AND THE ENVIRONMENT. CAN THE SPOILS OF SUCCESS BE CONTROLLED?

Morris, David F. (Wayne Law Review, Wayne State University Law School, 468 W. Ferry St., Detroit, MI 48202)
Wayne Law Review 19, No. 1, 181-219 (Nov. 1972)

The popular method for pollution control today is to enact laws and regulations directed at specific types of environmental abuse. The author contends that such an approach will not produce a long run solution to the problem of pollution. The proper solution, he states, is to permanently ingrain the costs of pollution within our present market structure by "internalizing" the environmental "externalities." This comment considers (1) the macroeconomic aspects of environmental pollution resulting from the interplay between growth in the gross national product and the population explosion, (2) an explanation of pollution as a market externality, (3) the economic tools available for the government to "internalize" the pollution externality, and (4) a program for future action.

The economic issues involved in our environmental crisis are not straightforward, and solution to this crisis is not a "no-growth" economy or the punishment of public villains through oppressive regulations. The problem of pollution involves resource misallocation, insufficient price structures, and increasing population. Individuals should be charged for the use of a resource previously considered free. If the environment is to be preserved, a long-range program must be developed preferably at the regional level. In the long run, consumption and production patterns must be altered, and new institutional arrangements must be implemented.
[193 footnotes] FTP

9.19 UPTAKE AND METABOLISM OF DDT BY SIX SPECIES OF MARINE ALGAE

Rice, Clifford P., and Harish C. Sikka (Life Sciences Div., Syracuse University Research Corp., Syracuse, NY 13210)
Journal of Agricultural and Food Chemistry 21, No. 2, 148-152 (Mar.-Apr. 1973)

The purpose of this work was to examine the accumulation and metabolism of DDT by representative species of marine phytoplankton. The culture of algae were grown axenically (in pure cultures) on the R. R. L. Guillard and J. H. Ryder medium "f" [Can. J. Microbiol. 8, 229 (1962)] with the modification that glycylglycine (5 nM) was added as a buffer and the pH was adjusted to 7.5. The cultures were grown on a reciprocating shaker under controlled environmental conditions (14 hr. of light per day at 500 ft.-candles and at a temperature of 23°±1° C.). ^{14}C-DDT in acetone was added to the medium.

The uptake of DDT by the various marine algal species increased linearly with an increasing level of DDT, but increased nonlinearly with an increasing concentration of cells. The algal species having the higher numbers of cells per unit of mass took up greater amounts of DDT per unit weight than did the species with the lower number of cells. Some data are presented in the table that follows.

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9.19 MERCURY IN THE ENVIRONMENT

Lepple, Frederick K.
Sea Grant Publication DEL-SG-8-73, 75 pp. (Mar. 1973). College of Marine Studies, University of Delaware, Newark, DE 19711. Price not given.

The report is presented in two parts. Part I, entitled "A Global Review" is a survey of the basic properties of mercury and its compounds as related to their effects on various facets of the environment. Some of the topics discussed are the chemical forms of mercury, the hazards of mercury, incidents of mercury contamination, governmental standards and tolerance limits, levels of mercury in the atmosphere, biosphere, lithosphere, and hydrosphere, and the flow of mercury through each segment of the environment. The "mercury problem" is evaluated locally and globally. There is a comprehensive review of the accepted methods of analyses for mercury and its compounds.

Part II is a report on recent examinations of the mercury levels in the Delaware Bay region; the data are compared with those found in the waters and sediments from other areas.

[3 figures, 7 tables, 153 references] FTP

9.19 HEAVY METALS IN BRITISH WATERS
(1.0146)

Preston, A. (Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, United Kingdom)
Nature 242, No. 5393, 95-97 (Mar. 9, 1973)

The Ministry of Agriculture, Fisheries and Food has been conducting a program of research and development on heavy metals in the marine environment. The program has two objectives: continued monitoring of concentrations in food fish and shellfish relative to estimates of human intake, and information on geographical distribution, biological fate, and effect on marine resources.

The results of surveys of British coastal waters conducted in 1969, 1970, and 1971 indicated that in the areas of large industrial and urban development high values of heavy metals were found as follows: the eastern Irish Sea, Cu, Mn, Ni, Pb, and Zn; the Severn Estuary, Cd, Cu, Ni, and Zn; the northeast coast, Cd, Pb, and Zn; and the Clyde River in the vicinity of Hunterston, Cu, Mn, and Ni. The metal content of seaweed in these areas was used as the indicator. Comparison of these results with seaweed samples collected 10 years earlier from the same locations showed no differences in concentrations. In addition, the survey showed that the heavy metals were confined to a thin margin around the contaminated coastal areas with the concentrations attenuating seaward. The concentrations in the open Atlantic Ocean were similar to those in the Irish Sea and the North Sea. There was no difference in concentrations of heavy metals relative to depth in the Irish Sea: an indication of thorough mixing.

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9.2 SURVEY OF SELECTED RETAIL FOOD STORES HANDLING FISH IN CUYAHOGA AND SUMMIT COUNTIES, OHIO

Konopa, Leonard J. (Kent State University, Kent, OH 44242)
Institute for 21st Century Business, Center for Business and Economic Research, College of Business Administration, Kent State University, Kent, OH 44242 (Jan. 1973), 82 pp.

This report gives the results of a survey made of randomly selected food stores in Cuyahoga and Summit Counties, Ohio, as part of a program to examine the marketing and physical distribution of fish and fish products into the Midwest. The Contents consists of:

Nature of the Survey; Retail Survey Methodology; Description and Classification of the Stores; Form of Fish Handled by Size of Store; Percentage of Store's Sales by Form of Fish Handled; Retailer's Markup; Sources of Supply; Trends in Retailers' Fish Sales the Past Five Years; Retailers' Preference in Handling Fresh Versus Frozen Fish; What Type of Brand Names Appear on the Stores' Fish Products?; Promotional Practices; Retailers' Opinions of Who Buys Fresh, Frozen or Canned Fish and Reasons Why They Do; Procurement of Fresh Fish by Retailers; Problems of Retailers Handling Fish; and Suggestions to Improve Sales of Fresh Fish.

Suggestions of the retailers to increase the sale of fresh fish was one of the highlights of the report. Some of them are: (1) A consumer education program should be carried out on a national scale to point out the desirable food characteristics of fish, the nutritive value of fish, and how to prepare fresh fish properly. (2) Government authorities should cease frightening the public periodically with pollution-related matters that might unnecessarily affect the sale of fish.

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9.19 (1.0146)

Except in the case of shellfish, metal concentrations were not reflected in edible portions of fish. Concentrations in inshore species were sometimes higher than in offshore fish especially in Cd, Hg, and Pb.

The author suggests that metal pollution is a national or regional problem which can be monitored and controlled by the governments involved. Pollution by lead involves transport by winds and may require controls by agencies other than local government. The deep-sea dumping of waste is a minor contributor to metal pollution and is expected to be brought under international control soon.

In the future, monitoring of pollutants will be performed to provide a basis for determining those concentrations which are compatible with public health and marine resources maintenance.

[1 figure, 4 tables, 15 references] SW

9.2

(3) Retail stores should use first class, separate displays to promote the sale of fish; the displays should be pleasingly designed and decorated. (4) Methods should be developed to prolong the chilled shelf life of fresh fish. (5) Methods should be developed to reduce the odor of chilled fish and shellfish. (6) More efficient procedures should be adopted so as to reduce the price of fish and shellfish to the consumer. (7) Flexible pricing procedures should be used so that the better quality fish will command the higher price. (8) A more orderly and regular supply of fish to the market at a reasonable price should be developed. (9) A policy of compulsory grading should be instituted.

[26 tables] FTP

9.3 TOXICOLOGICAL EVALUATION AND FOOD INTAKE STUDIES AS FUNDAMENTALS FOR THE ESTABLISHMENT OF PERMISSIBLE MAXIMUM LEVELS OF CHEMICAL SUBSTANCES IN FOODS

Mollenhauer, P. H. (Bundesminist. Jugend. Familie Gesund., Bonn-Bad Godesberg, Germany)

Chemical Abstracts 78, No. 1, 2766p (Jan. 8, 1973)

9.19

Species of algae	Number of algal cells per ml. of culture	Size of algal cell (μ)	Uptake of DDT 2 hr. after treatment (ng. of DDT per mg. of dry weight)	Concentration factor (ratio of DDT in the cell to conc. of DDT in the culture)
Skeletonema costatum	1.19×10^6	7 by 14	18.4	26,300
Cyclotella nana	0.83×10^6	8 by 8	14.5	20,700
Isochrysis galbana	1.40×10^6	4 by 4	12.5	17,900
Olisthodiscus luteus	0.115×10^6	11 by 11	12.0	17,100
Amphidinium carteri	0.178×10^6	15 by 15	6.6	9,400
Tetraselmis chuii	0.134×10^6	9 by 14	4.0	5,700

Note: One ml. of cell suspension in each treatment contained 0.03 mg. (dry weight) of cells and 0.7 p.p.b. of DDT.

[4 figures, 3 tables, 14 references] FTP

9.2 (1.82) USE OF A COMMERCIAL DREDGE TO ESTIMATE A HARDSHELL CLAM POPULATION BY STRATIFIED RANDOM SAMPLING

Russell, Howard J., Jr. (Div. of Fish and Wildlife, Dept. of Natural Resources, Providence, RI 02903)

Journal of the Fisheries Research Board of Canada 29, No. 12, 1731-1735 (Dec. 1972)

In stratified random sampling to estimate clam population, the total number of samples and their locations are influenced by the results of a preliminary survey. The survey, by rocking-chair dredge, is used to locate concentrations of clam abundance on a chart of the area; information from the survey is translated into contours of abundance on the chart. Subsequent sampling, based upon areas between contours or strata, is then directed toward approaching equal sampling fractions. Results of the dredge hauls are also plotted at their positions on the chart.

The accuracy of the estimates is dependent on a good evaluation of the efficiency of the dredge, which is determined mainly by the degree of compaction of the substrate. Thus the types of sediment of a given study area must be known so that dredge efficiency can be evaluated. The rocking-chair dredge used in the study smoothed out the nonrandom distribution of the clam which allowed population estimation with only 18 dredge samples. The good agreement between estimates by stratified random sampling and catch per unit of effort data from the fishing fleet indicates that the estimates will be accurate enough for management of the clam fisheries. [2 figures, 1 table, 9 references] SW

9.2 PERCEPTIONS OF AND PREFERENCES FOR ALTERNATIVE CONVENIENCE FOODS

Doyle, Peter, and John McGee (London Graduate School of Business Studies)
Journal of the Market Research Society 15, No. 1, 24-34 (Jan. 1973)

During the past several years a variety of methods have been developed (factor analysis, discriminant analysis, cluster analysis, and others) for studying how different brands or products are evaluated by consumers. The subject is important to marketing management because successful methods would provide valuable information to product planning and promotional strategy. In this paper, the authors describe the application of another method--the use of nonmetric multidimensional scaling. A small sampling (26) of homemakers was used, and the technique was applied to the problem of examining consumers' preferences for and perceptions of alternative convenience food products. The idea of the method was that a metric attribute space can be developed from ordinary rankings of product similarities. Furthermore, the concept of a joint space was used to incorporate perceptual and preference data. Eight food products were considered in this analysis. An excellent statistical fit to the similarities data was provided by the mapping of respondent perceptions into a three-dimensional space.
[5 figures, 2 tables, 16 references] FTP

9.2 ANTI-INTELLECTUALISM AND OTHER PLAGUES ON MANAGING THE FUTURE

Coates, Joseph F. (Office of Exploratory Research and Problem Assessment, National Science Foundation, Washington, D.C.)
Technological Forecasting and Social Change 4, No. 3, 243-262 (1973)

As society has become complex and integrated, the opportunities and needs to manage the physical and social technologies of society have become more urgent. Tools are developing that permit a more reliable anticipation and assessment of alternative futures. This paper discusses structural situations in our society that impede the effective management of the future. Some of these are (1) intellectual orientation of the intelligentsia, (2) a general ignorance of science and technology, (3) a failure to appreciate the strengths, functioning, and relationships of our political system, (4) lack of awareness of the intrinsic time constants of social change, (5) the substitution of piety for hard study, (6) a pervasive pessimism often grounded in ignorance, (7) special pleading of many interest groups, (8) lack of historical perspective, (9) a widespread aversion to social experimentation and a fear of new knowledge.

The purpose of this essay was to suggest the wide range of factors and forces that must be dealt with in a radical way if we are to effectively preserve and manage a socially and physically habitable world. A new frame of reference, a new systemic approach to the future, is suggested. The following should be adopted: (1) Use less piety and more profane study in the approach to societal issues; (2) Adopt new mechanisms for the study of societal issues; (3) Recognize that social

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9.3 (9.17)(9.2) NORTHWEST ATLANTIC FISHERIES ARRANGEMENTS: A TEST OF THE SPECIES APPROACH

Christy, Francis T., Jr. (Resources of the Future, Washington, D.C.)
Ocean Development and International Law Journal 1, No. 1, 65-91 (Spring 1973)

In the current negotiations over the Law of the Sea, one important issue is the jurisdiction over and management of living resources. Presently, two chief alternative proposals are being advanced: (1) the economic zone approach and (2) the species approach. The first would provide the coastal States with exclusive rights to manage and dispose of the fisheries off their coasts out to a fixed distance or depth. The second would call for separate treatment of three kinds of fish namely, those that migrate widely, those that spawn in fresh waters, and those that generally remain in coastal waters. The management and distribution of stocks of coastal species would be handled by negotiation among interested parties on a stock-by-stock basis, with certain preferential rights given to the coastal State. However, the distinction between the economic zone and species approaches is not entirely clear, and they may overlap in several aspects. The species approach is now being tested in developments taking place within the Northwest Atlantic fisheries. The present article discusses the events now taking place concerning the developments in the Northwest Atlantic area; speculates about the effects of these developments with regard to the management goals of achieving a reduction in physical waste, in economic waste, and in management costs; and, finally, offers some conclusions concerning the viability of the species approach to the Law of the Sea.

(over)

9.3 THE LAGGING LAW OF THE CONTINENTAL SHELF: SOME PROBLEMS AND PROPOSALS

Sutherland, Paul
Catholic University of America Law Review 22, No. 1, 131-155 (Fall 1972)

This comment discusses the problem of advancement of marine technology and the pace of legal developments relative to the continental shelf. The problems raised by the seabed law and technology will never be satisfactorily disposed of in a single remedial measure--a comprehensive and prospective international body of legislation must be formulated soon to avoid a crisis. At stake, the author indicates, are a tremendous resource, an unusual opportunity for development, and a whole new phase of international relations. Present law of the continental shelf is deficient in the areas of uniformity and foresight; it must be developed in anticipation of, rather than response to technology. The author believes that the Draft Convention, proposed by the United States in 1973, does not answer all the questions which have been raised in relation to seabed development, but it does provide a procedure for dealing with unresolved issues both now and in the future. To that extent,therefore, it is enormously significant.
[68 footnotes] FTP

9.2

invention and institutional change are a major, self-conscious approach to societal problems (the author believes that institutional inventions will soon supercede physical-technological change in importance in managing society); (4) Recognize that centralized, long-range planning is a key to the successful operation of a highly integrated socioeconomy (Planning should be on a time scale of 10, 20, and 30 years; however, the planning need not be completely centralized--much of it could be done on regional and local scales with central coordination.); (5) Planning should be on a noncrisis basis--long-range planning would eliminate many crises and would open up new and effective alternatives for dealing with inevitably critical situations; (6) Focus on opportunities rather than on the usual addiction to problems; and (7) Recognize that everything is related to everthing else. [36 references]

FTP

9.3 WHO OWNS THE OCEANS?

Knott, Richard C. (U.S. Navy, Washington, D.C.)
United States Naval Institute Proceedings 99, No. 3/841, 65-71 (Mar. 1973)

The author discussed various major law of the sea issues and the forthcoming Law of the Sea Conference.

FTP

9.2 [FISHING HARBOURS AND MARKETS IN VENEZUELA]
LOS PUERTOS PESQUEROS Y MERCADOS PORTUARIOS DE VENEZUELA

Turner, G. (Proy. Invest. y Desarrollo Pesquero MAC-PNUD-FAO, Apartado 2578, Caracas, Venezuela)
Inf. Tec. Proy. Invest. Desarr. Pesq., MAC-PNUD-FAO, Caracas, No. 49, pp. 5-46 (1972) 28 ref. (In Spanish)
Aquatic Sciences & Fisheries Abstracts 3, No. 1, 3Q809B, p. 178 (Jan. 1973)

The fishermen of Venezuela are dispersed among 300 (approx.) communities along the coast and rivers inland. Records of fish landing values and numbers of permits issued indicate that the income generated by more than half the registered vessels is less than 10,000 bolivars (about 30 US cents per bolivar); this income is paid out for the costs of the boat and the shares of the crew. The advantages to be gained by concentrating the vessels and fish landings at fewer sites along the coast are described. Factors to be considered in the selection of port sites and facilities are covered. Business methods are recommended to appraise port investment projects, to establish priorities, and to decide whether a capital outlay should be made. The application of benefit-cost analysis is suggested, using a procedure of discounting future cash flows. The present official policy of Venezuela regarding fishing ports is described.

SW

9.3 NEW CONCEPTS IN THE LAW OF THE SEA

Hargrove, John Lawrence (American Society of International Law, Washington, D.C.)
Ocean Development and Law Journal 1, No. 1, 5-12 (Spring 1973)

The current negotiations concerning ocean law show conflicts between two competing approaches; the first view is that the coastal State should control activities in any large adjacent ocean area, and the second view is that most of the ocean should be left open to the free use of all nations. The author believes both approaches are laissez-faire [characterized by a usual deliberate abstention from direction or interference], leave the distribution of benefits to arbitrary factors, and are based on national exclusivity.

This conflict manifests itself in international netogiations by competing claims regarding navigation, mineral resources, fishing, environmental protection, and strategic uses. A possible resolution of the conflicts has come forth through the concept of the whole ocean as a common resource of mankind in which no State has a right to benefit from the ocean except through arrangements sanctioned by the community, and rights to benefits are determined by membership in the community. The author suggests that such an approach would most likely produce a regime that would include (1) a narrow territorial sea with guarantees for various navigation; (2) a wide coastal band, in which the permanent managerial functions of the coastal State and a right to a large share of the proceeds of all commercial activities, will be coupled with permanent prerogatives of the international community; and (3) purely international management of the deep seabed.

(This paper is the text of a statement delivered by the author to the African States Regional Seminar on the Law of the Sea, Yaounde, Republic of Cameroon, in June 1972.)

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9.3 (9.17)(9.2)

In the arrangements for the Northwest Atlantic fisheries, 15 nations agreed to divide up among themselves the annual yields of 14 separate stocks of fish. Also, it has been proposed that there be a limit on total amount of fishing effort and a division of the total among States. According to the author, the controls are based solely on the physical attributes of fishing and fail to take account of economic consequences. He concludes, therefore, that the proposed arrangements for the fisheries of the Northwest Atlantic will not succeed as an example of the species approach, because the physical approach to the resolution of fisheries problems is both unstable and inflexible. He believes that modifications of an economic nature will have to be adopted.
[21 footnotes]

FTP

9.3 DEVELOPMENT OF THE FREEDOM OF SCIENTIFIC RESEARCH ISSUE OF THE THIRD LAW OF THE SEA CONFERENCE

Knauss, John A. (Marine Affairs, University of Rhode Island, Kingston, R.I.)
Ocean Development and International Law Journal 1, No. 1, 93-120 (Spring 1973)

As a possible result of actions relating to resource jurisdiction and other issues at the forthcoming Law of the Sea Conference, it may be that the conduct of bona fide research in the ocean will become more difficult, and in some cases, even impossible. Many nations view ocean research as a threat to their economic and political security. This paper examines the nature of the problem and considers possible solutions. The author discusses the importance of scientific research and the benefits that accrue to all mankind, and he attempts to differentiate between such research and those activities directly related to resource exploitation. Concerns of the coastal States are examined and suggestions are made as to how some of the concerns might be alleviated. Also, the opinions and proposals of the scientific community are discussed. Finally, the author offers some specific treaty language. Appendix A is a copy of a proposed U.S. position, "Freedom for Science in the Oceans," prepared under the auspices of the Ocean Affairs Board of the National Academy of Sciences (Revised June 1972).
[2 appendixes] FTP

9.3 OCEAN SCIENCE AND MUTUAL ASSISTANCE: AN UNEASY ALLIANCE

Pontecorvo, Giulio (Graduate School of Business, Columbia University, New York,N.Y.)
Ocean Development and International Law Journal 1, No. 1, 51-64 (Spring 1973)

The current negotiations on the Law of the Sea also concern the question of freedom of scientific research in the oceans. A narrow definition of the territorial sea, favored by the major maritime States, enable ocean scientists to work reasonably freely throughout the world. However, two developments have taken place in the last 25 years or so that have begun to impinge on the freedom of the scientists to carry out their work. These are (1) the seaward extension of national jurisdiction and (2) the attitudes of certain developing countries toward the role of science in society. In this article, the author examines the assumption that mutual assistance programs are a way to maintain freedom of ocean science. Also, he examines the necessary conditions for operation of these programs, enumerates the costs associated with them, and suggests an approach for their implementation.
[8 footnotes] FTP

9.3 (9.19) MARINE POLLUTION: A CRITIQUE OF PRESENT AND PROPOSED INTERNATIONAL AGREEMENTS AND INSTITUTIONS -- A SUGGESTED GLOBAL OCEANS' ENVIRONMENTAL REGIME

Lanctot, Lawrence R. (University of San Francisco)
Hastings Law Journal 24, No. 1, 67-109 (Nov. 1972) (University of California, Hastings College of Law, 198 McAllister St., San Francisco, CA 94102)

The author discusses problems of seabed resource development and resulting marine pollution and reviews proposals for an international seabed regime. He concludes that the current proposals are inadequate,and he suggests an alternative. Control of marine pollution and the preservation of the ecosystems of the oceans can be accomplished only by an international regime with comprehensive jurisdiction over all the oceans. This regime must have the power to study, to define, and to stringently regulate man's use of the marine environment. It must be empowered to analyze pollution and to establish and enforce control standards. Such an institution could adopt, within a specific time-table, an ocean master plan including an inventory of ocean resources, an analysis of known pollutants, baselines, and standards for regulation. This plan would designate oceanic areas as to their suitability for particular purposes, including protection for the abundant "pastures" of the open sea.
[175 footnotes] FTP

9.6 FISH NUTRITION

Halver, John E. (Western Fish Nutrition Laboratory, Bureau of Sport Fisheries and Wildlife, U.S. Dept. of the Interior, Cook, Wash.)
Published by Academic Press, Inc., New York, N.Y. (1972), 713 pp. Price not given.

This book gives a general review of what is known about the nutritional requirements of fishes. It provides a concept of the similarities and differences between requirements of various types of fish and the established nutrient requirements of agricultural livestock. The subjects covered are well illustrated. Each chapter gives an extensive bibliography, and there is an author and subject index. There are 11 chapters, each written by an expert in the field. The chapter titles are as follows: "Calorie and Energy Requirements," p. 2; "The Vitamins," p. 30; "The Protein and Amino Acid Needs," p. 106; "Lipid Requirements," p. 145; "Non-nutrient Components of the Diet," p. 182; "Enzymes and Systems of Intermediary Metabolism," p. 256; "Feed Formulation and Evaluation," p. 327; "Salmonid Husbandry Techniques," p. 375; "Nutritional Fish Diseases," p. 404; "Nutritional Pathology," p. 439; and "The Diet and General Fish Husbandry," p. 540. SW

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